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# EDITORIAL NOTES

## THE INSTITUTION MEETING

THE 79th Annual Meeting of The Institution of Gas Engineers in London last Wednesday was a very crowded one. There were over five hundred acceptances and the speakers' remarks had to be relayed to an overflow gathering outside the main Hall of the Institution of Mechanical Engineers. The business, too, was crowded; it seemed to us that a desperate attempt was being made to achieve the impossible—to make a pint pot hold a quart. Because of this an atmosphere of scurry and artificiality was engendered. Apart from formal business, which was dispatched with precision, the meeting was devoted to discussion of six short Papers comprising Communication No. 248, appropriately concerned with "further considerations" on efficiency and development in the Gas Industry. The Papers were of greater length than those of last year's crisp and successful symposium; perhaps this fact gave a lead to speakers to become more expansive. The official programme issued in advance of the meeting stated clearly and underlined that owing to the limited time available for discussion of the Papers not more than five minutes could be allowed to any one speaker. "The President," it said, "will knock with a mallet to indicate to a speaker that he must cease speaking." The implication was ignored, and throughout the President, Sir Frederick West, had to adopt the *rôle* of auctioneer; the hammer fell on most of the thirty or so speakers. Most of the participators had come to the meeting armed with manuscripts of a length which defied their proper reading within the alloted time. At times the discussion degenerated into a machine-gun fire of words, the meaning of which could not possibly have been grasped by the listeners. It was, in fact, very confusing. We shall endeavour to present an intelligible picture of the meeting, but wartime circumstances entirely preclude us from painting in every detail. And frankly, in the interests of the Industry, we welcome rather than otherwise this enforced course of action.

We have spoken of the timeliness of the subjects under discussion, and though we have criticized the crowded and confused form which the discussion took we should be the last to doubt its value; it is a matter of mental digestion and the time element. Very important and searching views were expressed on the policy and scope of the Gas Research Board, on the Gas Industry in relation to post-war domestic architecture, on scientific control in the retort house and its contribution to national fuel economy, on design and operation of gas-fired industrial equipment, on the ways in which the Industry can satisfy domestic heat requirements, and on the relation to and bearing on the Industry of university training. The field covered was extensive, the views advanced were not stereotyped, and the facts and figures put forward cannot be otherwise than helpful in formulating the lines of future development. The substance of the Papers and the discussion constituted a solid basis for encouragement, and lines demanding action were marked out. To the suggestions and implications we shall refer subsequently in these columns. The Presidential Address of Sir Frederick West was to our mind a model of condensation. It came as no surprise that Sir Frederick should discuss education and technical training, to the cause of which he has devoted much time and energy with, we think, conspicuous success. He dealt briefly with the progress of the Insitution, the Presidency of which he has filled so admirably and so untiringly during the past strenuous twelve months. More than once during this period we have uncompromisingly set out in these columns our opinion that the title "Junior" as applied to gas associations is meaningless, misleading, and anachronistic, and we were particularly glad to note Sir Frederick West's commendation of the suggestion we have made that the Institution should be further unified by the closer attachment of affiliated associations, and that these associations should be local branches of the Institution in a manner similar to the Institutions of Civil, Mechanical, and Electrical Engineers. The beneficial effects of such a long-overdue step would, we feel sure, be far reaching and would give the younger members a greater pride in the Industry.

On the broad plane the meeting was indicative of the consciousness of the need of a considerable re-organization and unification in the Industry. The situation was excellently defined by Mr. F. B. Richards, who remarked that we are living in times when, in the national field, democracy stands on trial. "I feel," he said, "that in the Gas Industry we have, in miniature, the same problems as we have in the national field. We have the problem of how to combine the exercise of freedom with the formulation of a common policy of unification and action. . . . I suggest that whether it be in the national field or whether it be in our own smaller field the same requirement is present, and it is by the same means—education—that a solution is likely to be found, education so that we know how to make a wise use of our opportunities." Some of these opportunities were envisaged in the Papers presented, and it is clear that the field of future possibilities is very great indeed. The need for unification in the Industry and vision of the fuel problem—domestic and industrial—as a whole is also abundantly clear. In which regard we think the comments of Mr. E. V. Evans at the President's luncheon were very much to the point. The future, he suggested, would be difficult to handle unless the Gas Industry had the good sense to handle it in a broad and comprehensive manner, and he added that we must more and more realize that gas and electricity undertakings are servants of the State and of the public. He spoke of the immense field of development for both industries, but emphasized the folly of thinking that the field could be covered by clogging each other's machinery.

Our intention is to publish as full a report of this year's Institution meeting as the present stringent circumstances permit. Of necessity our report cannot be confined within a single issue or, indeed, in two issues. Publication of Communication No. 248 was started in the "JOURNAL" last week, is continued to-day, and will be concluded next week, when we shall begin dealing with the discussion, which again of necessity must run over more than one issue. We have consolation in the thought that perhaps in this way it will be more easily digested, and that what may be lacking in ornateness of presentation will be offset by strictly utilitarian value. No one, in any case, would expect other than "austerity" issues of a serious technical journal in these days.

[*Personal, News Items, &c., on p. 471*]

# INSTITUTION OF GAS ENGINEERS

## The 79th Annual General Meeting of the Institution was held in London on Wednesday, June 10

## REVIEW OF THE PROCEEDINGS

THERE were over 500 acceptances for the meeting, which was held at the Institution of Mechanical Engineers. The President, Sir Frederick West, C.B.E., took the Chair at 10 o'clock and welcomed those present. Following the confirmation of the minutes of the 78th Annual Meeting in June of last year the result was announced of the ballot for Officers, Auditors, and Ordinary Members of Council.

President, 1942–43, Mr. E. V. Evans, O.B.E. ; Vice-President, 1942–43, Mr. S. E. Whitehead ; Auditors, Messrs. S. Lacey and A. Morland ; Hon. Secretary, Mr. John Terrace. Ordinary Members of Council, Mr. R. H. Duxbury, Dr. H. Hartley, Mr. R. D. Keillor, Mr. T. Reynolds.

The Secretary (Dr. W. T. K. BRAUNHOLTZ) reported the names of the District Members of Council nominated by the affiliated District Gas Associations for the year 1942–43 : Irish, Mr. H. L. Adams (Tipperary) ; Wales and Monmouthshire, Mr. J. H. Canning (Newport) ; Manchester, Mr. J. E. Lister Cooper (Yeadon) ; Southern, Mr. W. A. Howie (Maidstone) ; North of England, Mr. J. W. Pallister (Middlesbrough) ; Midland, Mr. C. F. W. Rendle (Redditch) ; Eastern Counties, Mr. F. H. Robinson (Bishops Stortford) ; North British, Mr. R. M. Simpson (Denny).

The President then moved the adoption of the 79th Annual Report of the Council for the year 1941–42 and the Accounts for the year 1941, and Mr. Bernard Browne seconded. Mr. George Helps expressed surprise that there was no reference in the report to gas quality, to which the President replied that the reports of the Committees of Investigation had not yet been approved by the Council, and thus the matter was not under discussion ; whereupon Mr. Helps moved that the report be referred back to the Council, asking who was running the Gas Industry—he did not know what to make about it all, but there it was. Mr. Helps did not find a seconder, and the motion for the adoption of the Report and Accounts was put to the meeting and carried.

### Presentation of Medal

The President explained that the Council had decided that for the past year no award should be made in regard to the Institution Gold Medal, the H. E. Jones Medal, or the Silver Medal relating to the District Associations. The only award was the Medal for the Junior Associations—to Mr. J. B. Walsh for his Paper " Co-ordination of Low and High Pressure Gas Supplies " to the Manchester and District Junior Gas Association in February, 1941. This Paper, said Sir Frederick, showed imagination and a thorough knowledge of the subject.

At this stage the President delivered his Address (see p. 455). A vote of thanks was proposed by Mr. George Evetts, who remarked that Sir Frederick had recognized the vast war effort of the Institution, had given them valuable pointers for future policy, had expressed his confidence in the future of the Industry, and had stressed the importance of the post-war problems with which the Industry will be faced. He had mentioned also the Gas Research Board and how the happy occupant of the Presidency in the year in which the war ends would have a fruitful field at his disposal. They could only hope that the next occupant of the Chair would be in the happy position of having this field to till.

The vote was seconded by Mr. F. B. Richards, who said how much they appreciated the reference which Sir Frederick had made to the selection of men who in the future would control the Industry. "We are living," remarked Mr. Richards, "in times when, in the national field, democracy stands on trial. We have to see whether we are capable of doing, within the framework of democracy, those things that have to be done if the form of civilization to which we have been accustomed is to survive. I feel that in the Gas Industry we have, in miniature, the same problems as we have in the national field. We have the problem of how to combine the exercise of freedom with the formulation of a common policy of unification and action. Whether we are successful in solving that problem, only time will show, but I suggest that whether it be in the national field or whether it be in our own smaller field, the same requirement is present, and it is by the same means—viz., education—that a solution is likely to be found, education so that we know how to make a wise use of our opportunities. Sir Frederick, in touching on the difficulties of the present time, sees in every difficulty an opportunity. That, I think, is the spirit which will lead us to success, if instead of regarding merely the difficulty or obstacle, we visualize every time an opportunity."

### Benevolent Fund

The meeting was then adjourned for the meeting of the Institution Benevolent Fund. The President said that during the past year 29 grants had been made, absorbing just over £1,000. The income from subscriptions and donations, apart from investments, was £865, slightly less than last year. With that from investments and Trust Funds there had been an expenditure of £1,048. Of the membership of the Institution, 54% subscribed to the Fund last year, and he urged a considerable increase in that percentage. He also urged that many more should consider signing the Deed of Covenant, undertaking to subscribe for a period of seven years. At the present moment, out of the 965 subscribers only 248 had signed the Deed. That had led to a considerable increase in income, of course, but if the whole 965 contributors were to sign the Covenant they would practically double the subscriptions.

The motion was seconded by Mr. L. J. Langford. A vote of thanks to those who had taken part in administering the Fund was proposed by Mr. B. R. Parkinson and seconded by Mr. R. Prince, who remarked that while, since 1931, Institution membership had increased by 21%, the number of contributors to the Fund had increased by only 14%, and the amount subscribed by 10%. They should not remain satisfied with that result.

### The Gas Industry: Efficiency and Development

This brought us to the technical business of the meeting—discussion on Communication No. 248, "The Gas Industry: Further Considerations on Efficiency and Development." This Communication comprised six short Papers: The Policy and Scope of the Gas Research Board, by Mr. E. V. Evans; The Gas Industry in Relation to Post-War Domestic Architecture, by Mr. E. Crowther; Scientific Control in the Retort House, by Mr. T. C. Finlayson; Gas-fired Industrial Equipment, by Dr. E. A. C. Chamberlain; The Contribution of the Gas Industry in the Domestic Field to National Fuel Economy, by Dr. Harold Hartley; and University Training and the Gas Industry, by Prof. D. T. A. Townend. The Papers were taken as read—apart from the briefest of introductions by the Authors—and the discussion was crowded. Practically all the speakers had to be brought to order by the President on the five-minute time limit basis. We commenced publication of the Papers in last week's "JOURNAL," continue them in our issue to-day, and intend to conclude them in next week's "JOURNAL," when we shall also devote as much space as we can to the discussion. The ball was set rolling by Prof. Townend, who was followed by Dr. C. J. King (Fuel Research Board), Mr. A. Forshaw (R. & A. Main, Ltd.), Mr. J. H. Dyde (Uxbridge), and Mr. W. T. Dunn, who were concerned with the Paper by Mr. Evans. Discussion followed on Mr. Crowther's Paper, the contributors, at the scheduled five-minute intervals being Mr. R. L. Greaves (St. Helens), Major Anderson (Shotley Bridge), Mr. R. J. Rogers

(Parkinson Stove Company, Ltd.), Mr. A. F. Oatley (Cannon Iron Foundries, Ltd.), Mr. N. Hudson (Mirfield), and Mr. L. W. Andrew (Gas Light and Coke). This brought us to Mr. Finlayson's Paper, on which, during the morning session, the speakers were Dr. S. Pexton (Gas Light and Coke) and Mr. Gaskill (West's Gas Improvement Company).

The meeting was then adjourned, and in the interval there was the President's Luncheon at the Savoy Hotel. Our report of the speeches is given later.

The business session was resumed at 2.45, Messrs. J. M. Webber (Croydon), H. S. Milne (Aberdeen), G. Helps (Nuneaton), S. K. Hawthorne (Birmingham), and G. C. Pearson (Birmingham), adding to the remarks on Mr. Finlayson's Paper. Punctuated by the mallet of the President, discussion continued without respite. On Dr. Chamberlain's Paper by Dr. D. G. Gunn (Yorkshire Industrial Gas Centre) and Mr. Dean Chandler (South Metropolitan); on Dr. Hartley's Paper by Mr. C. A. Masterman, Capt. J. G. Bennett (B.C.U.R.A.), Mr. J. E. Davis (South Metropolitan), and Messrs. G. C. Holliday and L. W. Andrew (Gas Light and Coke); on Prof. Townend's Paper by Messrs. John Terrace; H. J. Hodsman (Leeds University), A. McCullock (College of Technology, Manchester), C. A. Masterman, and L. H. Purkiss (Evered & Co.).

Time having precluded further discussion, there came a vote of thanks to the Institution of Mechanical Engineers, the Authors of Papers, the Scrutineers of the ballots, the Officers, Auditors, Council, and Committees of the Institution, and the Secretary and staff. This was proposed by Mr. J. T. Haynes, who likened the work of the Secretary and staff of the Institution to the mechanism of a well made watch. "However strong may be the driving force," he remarked, "unless the hair spring is finely tempered and accurately adjusted the watch will be useless. In Dr. Braunholtz we have the able and well balanced personality who quietly and unobtrusively controls the intricate organization." The vote was seconded by Mr. C. H. Chester.

### Presentation of Certificate

The meeting was concluded by the presentation to Sir Frederick West of the Presidential Certificate. This was performed by the new President, Mr. E. V. Evans, who said: "Sir Frederick is rather proud of the fact, as indeed he has reason to be, that he has arrived at the age of 70. What he has taught me is what I have read in books before, and particularly in the life of Goethe, who found the secret of growing old gracefully. That secret was that every moment of the day, from waking in the morning until going to sleep at night, should be used usefully, and that during that time a man should be fully aware of life. In Sir Frederick West we have actually seen this take place. Among the many lessons Sir Frederick has taught me is the one of the secret of growing old gracefully. Sir Frederick has won not only our admiration but our affection."

The vote of thanks was given hearty acclamation, and Sir Frederick West's response terminated the meeting.

# PRESIDENT'S LUNCHEON

THE President's Luncheon was held at the Savoy Hotel, the guest of honour being Captain Charles Waterhouse, M.P. (Parliamentary Secretary to the Board of Trade). Sir Frederick West was in the Chair.

The CHAIRMAN, proposing the toast of "The Guests," welcomed Captain Waterhouse and Sir Noel Ashbridge (President of the Institution of Electrical Engineers) and said that Sir Noel's ready acceptance of the invitation to the luncheon was an indication of a better understanding between the gas and electrical industries, which it was to be hoped would continue. (Hear, hear.) An equally cordial welcome was given to the representatives of Allied Governments, the Presidents and representatives of technical and scientific institutions, and to representatives of Government Departments. He added that the presence of so many of these various representatives was an indication of the wide collaboration between the Gas Industry and others on matters of the highest national importance.

Continuing, Sir Frederick said that the public was to a large extent unappreciative of the contribution which the Gas Industry was rendering and would continue to render in the preparation and manufacture of materials of war and, on the domestic side, in regard to the question of public morale. The position of the Industry in relation to the fuel problem was a unique and an impressive one. The solid and gaseous products of the Industry were capable of supplying all domestic needs and a wide range of industrial needs with a high degree of efficiency and with the complete abolition of the smoke evil. In addition, there were produced valuable by-products essential to the war effort, which were lost to the nation when coal was consumed in its raw state. The whole of the industrial sales of gas to-day was utilized in the preparation of munitions of war, and the by-products were used in the preparation of explosives and other munitions. At the same time the Industry was conscious of a somewhat tardy recognition by the Government, particularly in the early stages of the war, as exemplified in the somewhat low priority of materials and man power for the maintenance of the gas-works of the country, and also the distribution systems, particularly having regard to the great extensions that had been made necessary by the erection of new munitions factories. However, the Industry believed that the establishment of the Gas Directorate within the Board of Trade, with Dr. E. W. Smith as its head, was a decidedly progressive step. The new Directorate had already been assured of a hearty welcome by the Industry and it would receive whole-hearted co-operation. There were already indications of its effectiveness. The quiet satisfaction of the Industry with its contribution to the war effort, however, must by no means be mistaken for complacency. The setting up of a Post-War Planning Committee representative of the whole Industry was an indication that they were not unmindful of their weaknesses and of the need for a more unified policy, of the necessity for the co-ordination of their activities, and of some centralized form of control in the future organization of the Industry.

Captain CHARLES WATERHOUSE, M.P. (Parliamentary Secretary to the Board of Trade), said it was a matter of great regret to Dr. Dalton, the President of the Board of Trade, that he had been unable to be present. Having referred to his harmonious working with the Director-General of Gas Supply, he said the Board of Trade had always been in a rather peculiar position *vis-a-vis* the Gas Industry. It had certain definite responsibilities, but he understood that the Industry, on its part, felt it had been hampered by legislation and that its natural expansion was being checked unreasonably and that statutory control hung like a millstone round its neck. The Industry felt, he believed, that the Board of Trade construed its functions as seeing that all the statutes were being meticulously obeyed and to make sure the Industry did not make very much money, and if by chance it did make any money the Board of Trade stepped in to see that it was shared fairly and uniformly between the Industry and the consumers and various other interested parties. However, he believed the Industry had realized that a change had taken place in the last few years, or more especially in the last few months. Dr. Smith and Mr. Ronca during the last nine months had visited many areas. They had discussed problems with many representatives of the Gas Industry, and he hoped and believed they had proved they were out to help and guide the Industry. On their behalf he was able to say they appreciated they had received complete collaboration from the Industry and complete trust.

The difficulties of the Industry, continued Captain Waterhouse, were many and they were realized in London. There had been difficulties due to enemy action. It had been his task to keep closely under review the reports which reached the Board of Trade each week from the gas undertakings throughout the country. In many cases the works were in the centres of towns and this alone had rendered them vulnerable to the widespread enemy attacks of the past 18 months. The gas mains had been constantly cut and it had been a source of real encouragenent to the authorities in London to see how quickly the devastation, which from time to time had been wrought, had been repaired and how soon the supply had been restored. Much damage, too, had been prevented by the forethought of the Industry. Nevertheless, he believed there was something which could still be done to ensure that the gas-works of the country and the systems generally were as near enemy proof as was possible. The Industry was asked to look to its installations from that point of view because they would be failing indeed if they denied the possibility, if not probability, of widespread bombing in the future. There was in the Gas Industry a labour force of something like 130,000 Many were working in the retort houses under conditions which were never extremely pleasant, but which wartime precautions had made definitely unpleasant. Here again he invited the Industry to consider in what ways it would be possible to improve the working conditions in the works. Then the Industry had other difficulties. The changes in coal supplies were, he knew, a real source of annoyance, but these were inevitable under war conditions. In surmounting all these difficulties the Industry was rendering a real national service. They should plan the future of their Industry themselves. They should look forward to their own problems and see how the Industry could best fit into what they thought was going to be the general "set-up" after the war.

Referring to the Government's fuel scheme, he said the Industry must use its initiative to think out ways and means by which its consumers would consume less of what the Industry itself wanted to

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sell. He believed that great savings could be made in the industrial as well as the domestic field. The British public was always willing to respond to a lead and it was up to the Gas Industry to play its part in giving that lead.

Sir NOEL ASHBRIDGE (President, Institution of Electrical Engineers), proposing "The Institution of Gas Engineers," said he would like to add his congratulations to those of Captain Waterhouse to the Gas Industry on the amazingly good work the Industry had carried out during the troubles of the past 18 months. Continuing, he said his researches into some of the facts about the activities of The Institution of Gas Engineers had impressed him very much with the similarity between those activities and the activities of the Institution which he represented. On the professional side The Institution of Gas Engineers had rendered a great deal of assistance in connexion with the Central Register, and it was a matter in which his own Institution had also been usefully engaged in. Again, the two Institutions were carrying out similar work in connexion with education. While it should not be suggested that the Institutions should usurp the functions of the educational authorities, he felt there might be closer touch between the technical institutions and the technical colleges and universities than there had been in the past. Then there was the question of post-war planning, in regard to which both industries were very active. One approached this matter with somewhat mixed feelings. There were people who still thought that to spend much time on it was wrong, and that every ounce of energy should go to winning the war. On the other hand, the point of view was spreading that they must at this stage give some thought to post-war planning, otherwise a great deal of the enormous effort now being put forward might be wasted. Nevertheless he could not help feeling some apprehension at the number of post-war planning committees that were being formed and he sometimes wondered where it was all going to lead. He mentioned the question of co-operation between the gas and electrical industries which had been referred to by Captain Waterhouse, and suggested that there would be more co-operation. It seemed almost certain that co-operation between the two industries would more nearly fit in with the conditions to be anticipated after the war.

Mr. E. V. EVANS (President-Elect), responding to the toast, thanked Sir Noel Ashbridge for the gracious things he had said about the Institution and the Gas Industry generally. Years ago he would have found it exceedingly difficult to reply to a toast given by the President of the Institution of Electrical Engineers. In the past he had only known electrical engineers through the pages of the electrical trade journals which, for the good of his gaseous soul, he read assiduously. In more recent years, however, he had had the opportunity of working with prominent electricians on a body called the National Gas and Electricity Committee, a body of which he happened to be Vice-Chairman and which, at the moment, was deeply engrossed in the matter of gas and electricity rationing. As a result of that experience he had found, if indeed he did not know it before, that the electrician was made up of very much the same kind of live stuff as the gas man. His industry was, to him, a matter of great pride. He was an enormous worker. Efficiency and service were his watchwords, and his outlook generally was almost the same as that of the gas man. They were both superbly proud of their industries and saw scope in them for immense development. As to the future, in the opinion of himself and of many others, this was likely to be difficult to handle unless the Gas Industry had the good sense to handle it in a broad and comprehensive manner. In the future they must more and more realize that gas and electricity undertakings were public utilities and that they were servants of the State and of the public. There was an immense field of development for both industries, and it would be unwise to consider that that field had to be achieved by clogging each other's machinery.

The proceedings of the Luncheon closed with a cordial vote of thanks to the Chairman on the proposition of Sir DAVID MILNE-WATSON.

# WARTIME ACTIVITIES OF THE INSTITUTION

IN the 79th Annual Report of the Council it is recorded that the Institution continues to exercise its professional, technical, and educational functions, modified where necessary in accordance with wartime requirements. It is maintaining close collaboration, either directly or through the Gas Research Board, with Government Departments, in order that the technical information and resources of the Gas Industry may be at all times at the disposal of the Government. In September, 1941, the Mines Department appointed a Fuel Efficiency Committee to advise on the technical aspects of efficiency and economy in industrial fuel consumption. Mr. E. V. Evans, O.B.E., was appointed a member of this Committee. Subsequently, at the request of the Mines Department, the Institution and the Affiliated District Gas Associations collaborated with the principal engineering institutions in the organization of joint meetings in eight of the larger industrial centres, at each of which a member of the Fuel Efficiency Committee of the Department opened a discussion of ways and means of effecting the maximum economy and efficiency in the use of fuel.

The Institution was consulted by the Advisory Committee on Benzole Recovery of the Mines Department, regarding the compulsory operation of benzole recovery plant at gas-works and coke ovens, prior to the issue of an Order under the Emergency Powers (Defence) Regulations as Statutory Rules and Orders 1941, No. 1714.

A further example of wartime collaboration was the despatch to all Gas Undertakings on March 9, 1942, by the Institution, on behalf of the Ministry of Supply, of a Memorandum entitled "The Operation of Gas-Works Plant to Secure the Maximum Recovery of Ammonia and the Production of a Strong Ammoniacal Liquor," specially prepared by A. Key, D.Sc., Ph.D. (Research Chemist, Liquor Effluents and Ammonia Committee).

The Institution keeps its members and Gas Undertakings informed, by circulating memoranda and otherwise, of technical developments, orders and recommendations, specifications and the like, with particular reference to wartime conditions.

The Council has given consideration to means of ensuring the closest contact and collaboration between the Affiliated District Gas Associations and the parent Institution. It has decided that after each meeting of the Council a note should be prepared of the principal matters discussed and that this should be sent to the District Members of Council for report to their Associations not less than twice a year, preferably at their half-yearly and general meetings, and it has suggested that discussion of these reports should be specifically provided for in the agenda of such meetings. It has also decided that specific provision should be made in the agenda of every Council Meeting for the discussion of any matters that the District Members of Council desire to raise.

Eighty meetings of the Council and Committees of the Institution, including the special Committees of Enquiry set up in August, 1941, have been held during 1941–42.

The state of membership of the Institution on Dec. 31, 1941, is set out in the following table, which includes the corresponding figures at the end of 1940:

| Class | Membership at Dec. 31, 1940 | Plus Elected or Transferred in 1941 | Less Deceased, Resigned, Struck Off, or Transferred in 1941 | Membership at Dec. 31, 1941 | Increase or Decrease |
|---|---|---|---|---|---|
| Honorary Members ... | 34 | 0 | 17 | 17 | −17 |
| Members ... ... | 868 | 21 | 44 | 845 | −23 |
| Associate Members ... | 679 | 67 | 28 | 718 | +39 |
| Associates ... ... ... | 137 | 6 | 5 | 138 | + 1 |
| Students ... ... ... | 54 | 20 | 12 | 62 | + 8 |
| Totals ... ... | 1,772 | 114 | 106 | 1,780 | + 8 |

## New Members

The following have been elected to various classes of membership of the Institution:

*Honorary membership:* The Presidents (*ex-officio*) of the Gas Associations of Australia, Canada, New Zealand, and United States of America; Colman H. G., D.Sc., Ph.D., F.I.C.; Terrace, J.

*Associate membership:* Chamberlain, E. A. C., B.Sc., Ph.D., (Gas Light and Coke Company), Cole, G. H. (Harrogate Gas Company), Harrison, B. H. (Rugby Gas Company), Hooper, K. D., B.Sc.Eng. (Dudley, Brierley Hill and District Gas Company), Jarrett, L. W. (Commercial Gas Company), Kinsey, R. (Bradford Corporation Gas Department), Leach, C., B.Sc. (Halifax Gas Department), McFadyen, A. (Dumbarton Gas Department), McIntosh, D. (Kilmarnock Gas Department), Marshall, J. C. (Glasgow Corporation Gas Department), Nicholls, I. (West's Gas Improvement Company, Ltd.), Oliver, T. D. (Burnley Corporation Gas Department), Passmore, H. G. (Bilston Gas Light and Coke Company, Ltd.), Riches, J. C. (Tottenham and District Gas Company), Taylor, J. A. (Stretford and District Gas Board), Wait, N. T. (North Middlesex Gas Company), Whitehurst, F. L. (Sherborne Gas and Coke Company, Ltd.), Wilkinson, B. (Dunstable Gas and Water Company).

*Associateship:* Friedman, L. (Ascot Gas Water Heaters, Ltd.).

# PRESIDENTIAL ADDRESS

**[Communication No. 247]**

By Sir FREDERICK J. WEST,
C.B.E., M.Inst.C.E., M.I.Mech.E., M.Inst.Gas E.,
Chairman and Managing Director, West's Gas Improvement Company, Limited, Manchester

The Presidency of The Institution of Gas Engineers is the highest honour in the gift of members by means of which they may express their appreciation of services rendered by one of their fellow-members to the Gas Industry as a whole, in addition to those rendered to the particular Undertaking with which his life's work is identified. My own pleasure in having been deemed worthy of so signal an honour is the greater because, for the first time, a member of the contracting side of the Industry has been honoured in this way under the terms of the Royal Charter and the new Constitution of 1929, when the technical members of the contractors' and manufacturers' staffs became eligible for membership. I am confident that my colleagues in this section of the Industry are fully conscious and highly appreciative of this honour and, I hope, feel that they enjoy some share in this recognition of their contribution to the welfare and progress of the Institution and the great Industry which it represents. My pleasure, however, is further increased by the fact that my respected father—the late John West—was President of the Gas Institute in 1894. With all this in mind, I assure you that no effort has been spared on my part during the past twelve months to merit the honour you have conferred upon me and to uphold the influence and importance, as well as to further the interests, of the Institution to the greatest possible extent.

### *Progress of The Institution*

These are difficult and stirring times. The normal and steady progress of a technical institution such as ours must of necessity be governed by, and adapted to, the intricacies and the varying vicissitudes of the war effort. Despite, however, the heterogeneous mass of additional duties and responsibilities placed upon our members and on all those associated with them in the control of a great public utility service, our Institution has made steady, if not spectacular, progress. The Council has met regularly for some time past, and its agenda have covered a very wide range of subjects and activities. We held a very successful Annual General Meeting last year, and I venture to hope this year's Meeting will be equally successful. Undoubtedly the outstanding success of last year's Annual Meeting resulted from a happy thought of the President, Mr. George Dixon, in arranging for a series of short Papers on topical and controversial subjects, which produced a sharp, brisk and fruitful discussion. We are following a somewhat similar procedure at this Annual Meeting, with a smaller number of subjects. The precedent set last year is one which, as regards the type and length of technical contributions to the proceedings of our Annual Meetings, has much to recommend it, even when we reach normal times. There are many advantages in staging a platform, calculated to provoke discussions on current and controversial subjects, on which the greatest possible number and variety of views can be expressed. The lengthy and well-illustrated Papers of the type presented in previous years, which place on record important technical achievements and developments, need not disappear, but could be presented under the ægis of the Institution at convenient intervals throughout the year. From the point of view of the Technical Press and the time at the disposal of our members, it would surely be advantageous to spread out, as far as possible, the technical contributions made at the invitation of the Institution.

Four of the subjects presented at last year's Annual General Meeting were of such importance and urgency that they have been referred to special Committees of Enquiry for investigation and recommendation, and it is possible that this same course may be followed with regard to some of the subjects discussed today.

Our membership indicates a steady increase in numbers, but your Council has always in the forefront "quality" rather than "quantity," and the qualifications required by the By-laws have been strictly insisted upon.

### *War Service*

It is a source of gratification to record that over 80 of our members are known to be serving with His Majesty's Forces. The Gas Industry is already the poorer by those who have already made the supreme sacrifice; we cherish their memory with honour and gratitude. At this gathering we take the opportunity of paying tribute to all those still serving, with a sincere wish for their safe return. Nor do we forget those at home performing their normal work and, in addition, wholeheartedly undertaking A.R.P. functions, Home Guard, N.F.S., and the multitudinous other duties associated with Civil Defence and the war effort generally. Arising from these many activities we record with satisfaction many acts of bravery which have deservedly received recognition at the hands of His Gracious Majesty the King.

### *District Gas Associations*

In these days, when it is more than ever necessary that the Industry should speak with one "voice" rather than in disconnected units, it is essential that the relations between the parent body and the Affiliated District Gas Associations should be the closest possible. The Council of the Institution, in its constant endeavour to maintain a close liaison with the District Associations, has adopted a policy of circulating after each Council Meeting a short précis of the outstanding matters discussed. This is sent to the representatives of the Districts on the Council, with the suggestion that Institution policy and business should form a definite part of the business of the District Associations at their yearly or half-yearly meetings. It is hoped by this means to present an opportunity for a wider consideration of policy and the various problems confronting the Gas Industry.

The suggestion has been made that the Institution, throughout the country, should be further unified by the closer attachment of the Affiliated and Junior District Associations to the parent Institution and that these should all be local branches of the Institution in a similar manner to those of our sister Institutions of Civil, Mechanical and Electrical Engineers. The suggestion has much to recommend it, especially since the day has now nearly arrived when every member of the technical staffs of the Industry is, or should become eligible for Membership, Associate Membership or Studentship of the Institution.

### *Technical Education*

Several subjects which normally might form parts of a Presidential Address are to be covered in the series of short Papers, which will be presented today. Technical education deserves special consideration, and in this respect mention must be made of a recommendation of the Education Committee of the Institution. It was reported at our December Council Meeting that "the Gas Education Committee had considered the standard of general education required for entry to the examinations of the Institution." The Council approved the Committee's recommendation that "while it was undesirable to make any alterations in the regulations during the war, the attention of gas engineers should be drawn to the need when selecting pupils and/or apprentices of paying due regard to the standard of their general education."

We can only succeed as an Industry if we have the very best

of human material from which to train and select the gas engineers and managers of the future.

The technical head of a Gas Undertaking must not only possess a considerable knowledge of the principles of the three great branches of engineering, civil, mechanical and electrical; he must also have a thorough knowledge of the chemistry of gas manufacture. He must be qualified to act as an administrator, he is called upon to deal with commercial problems relating to the sale of gas and its by-products, and he must be capable of handling labour in its many phases. Above all he must have the gift for leadership. With this wide range of demands upon the personnel of the Industry and the responsibilities involved, it is essential that the governing bodies of Gas Undertakings should see to it that the remuneration is sufficiently attractive to induce a constant supply of well-trained men to come forward for the higher positions in the Gas Industry.

The Report of the Board of Examiners, contained in the 18th Report of the Gas Education Committee, 1940-41, emphasizes some other points which deserve our serious consideration. Here are two observations which we seniors cannot ignore.

> "The examiners are of opinion that engineers and their staffs are giving insufficient opportunity for instruction to their pupils and apprentices and/or the latter are not sufficiently observant of detail."
>
> "It appears that many junior students either do not keep, or are not advised to keep, a diary and make notes and sketches of the practical work which they have to undertake each day."

### *Technical Development and Research*

I have already indicated that our activities must be primarily dominated by the exigencies of war. But this has not led to stagnation, and if the work of several of the Special Committees of the Institution and of the Gas Research Board could be portrayed in full an interesting and valuable contribution to the war effort would be revealed. Technical developments and research with which we are concerned in normal times, and upon which the success of our Industry so much depends, must of necessity be subordinated to changes in practice imposed by War conditions. But it does not necessarily follow that technical development is "marking time," and it is even conceivable that some of the imposed conditions may give rise to repercussions which will bear fruit in future developments. Is it not possible that the restriction of that freedom of choice and selection of coal, which we have hitherto enjoyed but which has been replaced by a dictated acceptance of what is available, may have indicated that the range of suitable coals is not so narrow as we thought it was, and that carbonizing practice can be made more flexible than we anticipated? Is it too much to expect that the almost compulsory recovery of benzole may prove more profitable than many imagined, apart from the fact that it will make the country appreciably less dependent in the future on imported fuels? May not the great increase, necessitated by war requirements, in the variety of materials derived from our by-products widen the scope and usefulness of our Industry in the future? Substitution of products or materials, unavailable owing to war-time restrictions, has led to the introduction of new products possessing advantages unrealized in normal times.

### *The Future*

The contribution of the Gas Industry to the war effort has been quietly and unobtrusively carried on. Its value cannot be over-estimated but the public is in many respects quite ignorant, and to that extent unappreciative, of its dependence upon our efforts for the successful prosecution of the war. The Government, particularly in the early stages, was somewhat tardy in its realization of this dependence. Difficulties in the obtaining of priorities and the protection of our man-power were outstanding features. Fortunately this outlook has changed, and the appointment of a Directorate of Gas Supply under the ægis of the Board of Trade is a recognition of the essential character of our Industry, which should indicate the possibility of a bright augury for the future, provided we adjust ourselves to the full significance of this measure. We must now assume that the Government has indicated clearly that there is under review a re-organization of the Gas Industry to enable its functions to be performed more satisfactorily. Surely it is not overstating the case to say that in the minds of many of our leaders there is a consciousness of the need of a considerable re-organization and unification, and I am confident the members of the Institution will not be lacking in applying their technical skill and ability to the translation of these ideas into action.

### *Post-War Planning*

For this reason we welcome the formation of the Post-War Planning Committee of the British Gas Federation, on which we confidentiy expect the members of the Institution to pull their full weight. It is surely much better that the Industry itself should formulate a scheme of re-organization than wait until one is imposed upon it from without. It would be unfair to attempt to anticipate the probable conclusions of this Committee, but we can prepare ourselves for certain necessary changes. First and foremost there must be more definite control of our activities. The unrestrained liberties of the past, which too often led to parochialism and sometimes to inefficiency, must disappear. There must be some standard in the quality and purity of gas, some standardization in gas appliances, some regulation of the disposal of coke, and some governing body or bodies with powers adequate to the control and enforcement of a common policy.

The Institution must and will implement the work of the Post-War Planning Committee, and members in their respective spheres and through their appropriate organizations should formulate their views without delay and make them known in the proper quarter.

It is now firmly fixed in the minds of those in official and Government circles that coal is indeed the life blood of our industrial and social civilization and the greatest efforts are being made on all sides to make the very most of this irreplaceable asset. Our new Director-General has devoted a considerable portion of his time and energy to the education of users of industrial gas in the ways and means of preventing waste. Our duty is to see that the very best use is made of the coals, however unsatisfactory some of them may be, allocated to the Gas Industry. Retort house economy and scientific control of carbonization, the design and operation of industrial and domestic appliances, are subjects which force themselves more than ever on the attention of the gas engineer, and it is therefore most appropriate that three of the Papers which are to be laid before you at this Meeting deal with different aspects of these most important questions.

In concluding this Address, which is curtailed to subscribe to the spirit of a one-day Annual Meeting, I desire to express my grateful appreciation of the unfailing co-operation at all times of the members of the Council and the Secretary and his staff in the work of the past year. Despite the restrictions of our activities, I have enjoyed the Presidency, although conscious that duties as Chairman of two important Government Committees in the North-West have, to some extent, limited the time at my disposal.

My contacts with the District Associations have been most interesting and instructive. There is plenty of evidence to indicate a loyalty to, and interest in, the parent Institution which is both encouraging and stimulating.

Reference could have been made to the work of the Gas Research Board and other research associations, to the necessity for the economical use of gas and the means for securing it, to the influence of technical education on these and other aspects of the problems before us, but all these questions are being well and adequately dealt with in the short Papers which are submitted for your discussion. One does wish to say, however, on the question of research that the Institution must not lose sight of the fact that research is being prosecuted not only by research associations but by contractors and manufacturers generally, and that the Gas Industry must approach this subject in a very broad and generous spirit.

It is my sincere hope that my successor may witness, during his year of office, a successful termination of the present struggle and the opening of a new era of usefulness and prosperity for our great Industry.

# THE GAS INDUSTRY IN RELATION TO POST-WAR DOMESTIC ARCHITECTURE*

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In almost all its aspects, the present war differs profoundly from that of 1914-18, but in none is the difference greater than in the thought and emphasis devoted to considerations of post-war activities and conditions of life. So marked is this emphasis as to have led to apprehension in the minds of many that it may detract from the war effort itself, and the danger is one that cannot be ignored. Assuredly no individual, and no industry, have the right to occupy themselves with such considerations until they have done all within their power towards the victorious prosecution of the war: this done, however, nothing but good can come from preparation for the problems which lie ahead, problems which will call for efforts no less intense than do those of the present.

The Gas Industry has a part to play and a service to render in the post-war era comparable with its supremely important part and service at the present time: provided that it occasions no restriction upon this present service, preparation to enable the Industry to give of its best after the war is an essential element of its war-time activities.

The following remarks are submitted, therefore, as a contribution towards one aspect of such preparation. They attempt to express the outlook of one provincial Gas Undertaking upon a subject capable of many and diverse solutions, the best of which is unlikely to emerge except through wide and well-informed discussion.

## Social Developments

With the coming of peace, the accumulation of social development pent up by war is released, and flows in spate to overtake lost years, often sweeping away landmarks and boundaries which have stood firm against the steadier flow of the past. Thus it is that war is a time of transition, and indications are not lacking that substantial social changes await the end of this war. It is vital to the future of the Gas Industry that this should be recognized, and efforts made to assess correctly these changes, in preparation for development with and not against their current.

Even before the war, much attention had been given to problems of the location of industry, town and country planning, slum clearance and overcrowding, and the general health of the people. Since then evacuation has done much to awaken the social conscience of the country, while the suspension of house building, coupled with the destruction of much property, has produced a situation which will require to be met by a re-housing programme of the first magnitude.

## Housing Problems

The Gas Industry must have a voice in this programme, not merely in its own interest, but because it can do much to direct it along lines most in harmony with the needs of the individual, and with national economy and well-being. It is most unlikely, and fortunately so, that the methods employed from 1918 onwards to meet a similar problem will persist unaltered. The history of re-housing in those years is a record of improvization, statute following statute in rapid succession as new urgencies and new aspects of the problem forced themselves upon the legislature, but much experience has been gained, which will prove most valuable in the future. In particular, the principle of mandatory as opposed to permissive legislation in respect of housing requirements has been so long established as to permit of the emergence of all its implications; more recently, a code has been formulated to deal with overcrowding. Covering the wider issues, town and country planning measures are becoming familiar instruments to those concerned in such questions. In the light of this experience, and of the magnitude of the work carried out between 1919 and 1939, during which years some 3¼ million houses were built, the way is clear for a planned advance of at least equal magnitude, and upon sounder lines after the present war. It may be expected that full use will then be made of the powers conferred by the Town and Country Planning Act, 1932, to regulate development and to prevent the further growth of over-urbanized areas, and that the practice and standards of housing development will be unified by the creation of regional authorities to take over duties hitherto performed by smaller local bodies. Such steps must of necessity bring the work of the qualified architect into greatly increased prominence, and confer upon him a share in the direction and control of domestic building from which speculative considerations have excluded him, all too frequently, in the recent past. This restoration of the architect to his rightful place is by no means the least of the benefits to be anticipated from a planned system of post-war housing development.

While the present subject is concerned only indirectly with many of the points to which reference has been made, it may be mentioned in passing that re-development must in many cases lead inevitably to the necessity for heavy capital outlay on the part of the Gas Industry, as of other utilities, in the provision of mains and distribution works generally, and it should be recognized by the responsible authorities that this outlay should be recovered from them by the Industry, and treated as an integral part of their general development costs. Failing this recognition, it is clear that it must be directly recovered from the consumers concerned, a method which will certainly prove more costly to them, and will tend to restrict their full enjoyment of the amenities which the Industry can provide.

Problems of equating gas production to the growth of demand are less likely to be acute, as the speed at which re-housing will be permitted to proceed will certainly be carefully controlled. Against the available skilled labour, building materials, and transport, will be placed competing requirements for new housing, for new industrial premises, for the conversion of factories from war to peace production, and for the repair and restoration of damaged property of every kind.

## Standardization

The role of the architect in these activities is of the first importance. In domestic building he will have control not merely of such fundamentals as floor area, cubic content of rooms and the like (to which he was virtually restricted in too many housing schemes of the past twenty years) but also of the soundness of construction of the buildings, of their external appearance and grouping, of the selection and approval of their materials, and, as the Gas Industry hopes and believes, of their heating and ventilating arrangements. The profession of architecture is already making its preparations. New materials of construction are being examined and considered, and new methods of construction are under review, whereby houses may be built to a great extent in the workshop, and assembled on the site. A substantial advance in standardization of parts and fixtures of every class is at hand. Perhaps as significant a feature as any, from the point of view of the Gas Industry, is the suggestion that "furniture" should largely become an in-built part of the house, a suggestion which clearly points the way to a similar treatment of gas-consuming appliances of every kind, built to conform to standardized space provisions and arrangements.

Such a development is most desirable, as it immediately disposes of two difficulties which have long proved an obstacle to the Industry: the first that certain gas appliances, notably cookers and water heaters, duplicate the functions of solid fuel arrangements incorporated in the fabric, so that an unnecessarily large capital in total is associated with the house; the second, that in consequence of these arrangements it is often found difficult to accommodate such appliances,

* Paper to the Institution of Gas Engineers, June 10. [Communication No. 248.]

and impossible to locate them at the most convenient point. The fact that such duplication takes place in so large a number of houses, in spite of the difficulties named, is in itself clear evidence that the need for these gas appliances exists: it is for the Industry to demonstrate the fact so conclusively to the architect that his future practice will be to introduce these appliances as an essential part of the structure, and to omit the obsolete solid fuel appliances which they have superseded.

## Factors for Consideration

The presentation of the case requires the assessment of a number of factors with some accuracy, of which the following are most important:

(i) The accommodation needed by, and likely to be provided for the public.
(ii) The heat-using services needed by the public, and the price they can afford to pay for them.
(iii) National interests likely to be affected by these provisions.

### *Accommodation*

It is obviously impossible to deal adequately with these factors in the compass of these remarks, nor can the Gas Industry hope to arrive unaided at reliable conclusions upon all of them. In their consideration, however, regard will have to be given to certain tendencies already fairly well recognized. The probability that the process of levelling-up of effective incomes will not be reversed after the war, suggests that the general standard of living of the masses of the people will not fall as compared with that of pre-war years, even though circumstances may enforce a rigid economy upon the country as a whole. Unless the birth rate reverses its tendency, and begins to increase, the progressive increase in expectation of life observed before the war suggests that the average size of families will continue to diminish, and a largely increased proportion of dwellings to accommodate two persons only will be called for. The break with domestic life occasioned by the war has extended to young women as well as to young men, so that its effects upon post-war domestic life may be more profound than were those of 1914-18, when the majority of young women continued to live at home. This fact may lead to an extension of community life in the new generation, with fewer meals taken at home, and less time spent there, and certainly to a strong disinclination to be occupied in any non-essential household duties (such as attention to rooms for which there is no regular use) and to an equally strong demand for labour-saving methods of every kind. This raises the question of the relative importance of flats and individual houses in the future, and while no opinion is ventured here, it is necessary that the Gas Industry should be prepared to deal with both types of dwelling.

### *Heat-Using Services*

As to the second factor, that of heat-using services required, while the adoption of some measure of heat insulation will tend to diminish consumption, it is an accepted fact that the present standards of domestic heating and of the provision of hot water are below a satisfactory level, both qualitatively and quantitatively.

From a considerable mass of evidence* it has been established that the "useful" heat consumption for all purposes (that is, the total heating values of fuels consumed, multiplied by their efficiency in use) of working class dwellings averages 274 therms per annum. This figure is representative of the country as a whole, and includes heat for cooking, space heating, water heating, laundry work, and for incidental purposes. It is possible that through the factors already indicated —a slight reduction in the size of the average household, the absence of unused rooms, a proportion of meals taken away from home, heat insulation, etc.—a small addition to the total consumption of "useful" therms will be sufficient in the post-war home to raise the standards of comfort to a satisfactory level.

The Gas Industry has been concerned to demonstrate that it is capable, if entrusted with the provision of the whole of these "useful" therms, not only of adding enormously to the comfort, convenience and cleanliness of the home, but of doing so at a cost within the reach of all. A particularly valuable demonstration of this contention is afforded by the work of the Gas Light and Coke Company at Kensal House,† where it has been conclusively shown that an ample and satisfactory heat service can be afforded by a combination of gas and coke at a cost appreciably lower than that involved in the use of earlier methods, and by gas alone at a cost no higher than that of such methods.

In the Author's Undertaking, an uncomprising "all-gas" heating policy was adopted some six years ago, a policy which has been fully justified by all the evidence so far accumulated. Detailed records have been kept of over 200 typical examples of these houses, and it has been ascertained that their annual consumption of "useful" therms averages 316 per annum. The difference between this figure and that of 274 quoted above is no doubt due in some part to the climatic conditions of the North-East coast, but in the main is due to the fact that the standard of comfort enjoyed by the occupants of these houses is appreciably above the average level of the country as a whole. The annual cost of the gas consumed (pre-war prices) is strictly comparable with the fuel costs in similar dwellings heated by earlier methods, as the following examples of the fuel bills of consumers before and after the conversion of their houses to all-gas heating show:

| Example | No. of principal rooms | Before Conversion to All Gas | | | All Gas | |
|---|---|---|---|---|---|---|
| | | Coal consumed, tons | Gas consumed, therms | Total fuel bill | Therms* | Cost |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | | | £ s. d. | | £ s. d. |
| A | 4 | 4·0 | 52 | 8 10 5 | 515 | 9 3 10 |
| B | 4 | 4·0 | 104 | 10 0 3 | 627 | 10 12 4 |
| C | 5 | 3·0 | 285 | 12 3 8 | 686 | 12 3 4 |
| D | 5 | 5·6 | 284 | 16 14 5 | 1,057 | 16 15 10 |
| E | 6 | 5·5 | 200 | 15 3 8 | 858 | 15 3 0 |
| F | 6 | 5·5 | 411 | 19 1 3 | 1,177 | 19 4 1 |

### *National Interests*

The information already collected by numerous Undertakings along such lines as these is sufficient to supply a working basis for the future, and to enable the Gas Industry to make its recommendations with full confidence in its ability to supply the services which the public will need, at prices within reach.

It is axiomatic that, to meet with acceptance, these recommendations must not only offer improved amenities to the householder, but must be in line with national interests. The Industry is equally well placed in this regard, since the two paramount demands of the nation in respect of fuel utilization will be the betterment of public health (involving *inter alia* the disappearance of the domestic smoke nuisance), and the avoidance of waste of fuel resources.

## Ventilation

Before proceeding to an attempt to apply these outlined views to an actual installation, one final point calls for comment. Of recent years there has been a retrograde tendency in room ventilation which should not be tolerated in post-war re-housing. While a small economy may result from the substitution of air bricks for flues in secondary bedrooms (an admission that ventilation is indeed necessary), this economy is too dearly bought, as it cannot fail to be prejudicial to the occupants of such rooms. With the control of design in the hands of the architect, it is confidently anticipated that this practice will be discontinued.

## Proposals for the Equipment of Dwellings

The Author has been sufficiently venturesome to offer as a basis of discussion the following proposals for the equipment of three types of dwelling:

(*a*) The non-parlour type, individual house (pre-war cost in the provinces, about £300 to £350, plus site value).
(*b*) The non-parlour type, two-bedroom flat (pre-war cost £325 to £375, plus site value).
(*c*) The semi-detached villa, having two entertaining rooms (pre-war cost, £600 to £650, plus site value).

These proposals are set out in an Appendix to this Paper.

*Masterman, C. A., *Trans. Inst. Gas Eng.*, 1936-37, **86**, 983.
"Report of Ministry of Labour and National Service on Expenditure of Working Class Families", December, 1939.

†Leslie, S. C., *Gas J.*, 1937, **220**, 78.
* Actual therms purchased: to convert to "useful therms multiply by efficiency in use.

# APPENDIX

## EQUIPMENT AND COST OF PROPOSED "ALL-GAS" DWELLINGS, AS COMPARED WITH PRESENT DWELLINGS

### (A) NON-PARLOUR TYPE SEMI-DETACHED HOUSE

*Example:* Newburn Urban District Council, Walbottle Estate

Rental:

| | |
|---|---|
| Net Rental ... ... ... | 6s. 10d. |
| District Rates ... ... | 3s. 0d. |
| Water Rate ... ... ... | 6d. |
| Gross Weekly Rent ... ... | 10s. 4d. |

DIMENSIONS, sq.ft.

| | As Built | All-Gas |
|---|---|---|
| Ground plan area ... ... | 428·5 | 428·5 |
| Living room ... ... ... | 160 | 153·5 |
| 1st bedroom ... ... ... | 149 | 154·75 |
| 2nd " ... ... ... | 91·5 | 87 |
| 3nd " ... ... ... | 73·5 | 72 |
| Kitchen-scullery ... ... | 64 | 80 |
| Larder (above coal-store) ... | 14·5 (75 cu.ft.) | 14 (120 cu.ft.) |
| Entrance hall ... ... ... | 49·25 | 49 |
| Bathroom ... ... ... | 22·75 | 24·75 |
| Lavatory ... ... ... | 12·75 | 12·75 |
| Coal store (below larder) ... | 14·5 | Nil. |

VENTILATION

| | As Built | All-Gas |
|---|---|---|
| Living room ... | Chimney breast, 9 in. ×9 in. | Flue blocks, 12 in. ×2½ in. |
| 1st bedroom ... | " " " | " " " |
| 2nd " ... | Air brick only | " " " |
| 3rd " ... | " " | " " " |
| Kitchen-scullery | " " | Two flue blocks, 12 in. × 2½ in. each. |

COST*

| | As Built £ s. d. | | All-Gas £ s. d. |
|---|---|---|---|
| Structure ... ... | 283 15 6 | Structure ... ... ... | 284 3 8 |
| (1) Combination range .. | 7 10 0 | (1) Gas cooker and plate warmer ... ... ... | 10 5 0 |
| (2) 20 gal. cylinder and piping ... ... | 8 17 3 | (2) Gas water heater ... | 4 19 0 |
| (3) 1st bedroom fireplace | 0 18 9 | (3) 30 gal. cylinder ... | 4 10 0 |
| (4) Wash boiler ... | 1 12 6 | Lagging ... ... | 1 7 6 |
| | | Piping ... ... | 2 10 0 |
| | | (4) Clothes drying cabinet | 8 8 0 |
| | | (5) Water heater cabinet | 6 14 0 |
| | | (6) Canopy ... ... | 1 14 0 |
| | | (7) Washing machine ... | 5 0 7 |
| | | (8) Living room fireplace | 2 10 0 |
| | | (9) 1st bedroom " | 2 10 0 |
| | | (10) 2nd " " | 2 10 0 |
| | | (11) 3rd " " | 2 10 0 |
| | | (12) Kitchen radiator ... | 2 1 9 |
| Total ... ... | £302 14 0 | Total ... ... | £341 13 6† |

* Exclusive of site, sewers, roads and services in each case (all costs at September 1939).

† Net increased cost, £38 19s. 6d., or 13 per cent (a similar percentage upon the net rental equals 11d. per week).

The Author's acknowledgments and thanks are due to Mr. J. A. Weatherley, L.R.I.B.A., the Architect responsible for the actual housing scheme upon which the above tabulation is based, for his advice and enthusiastic interest in the proposals set out.)

### (B) NON-PARLOUR TYPE TWO-BEDROOM FLAT

*Example:* Estate at North Gosforth, Newcastle-upon-Tyne

DIMENSIONS, sq.ft.

| | As Built | All-Gas |
|---|---|---|
| Ground plan area ... | 763·0 | 763·0 |
| Lounge ... ... | 172·8 | 172·8 |
| 1st bedroom ... | 133·0 | 126·375 |
| 2nd " ... ... | 118·125 | 97·3 |
| Hall ... ... ... | 71·625 | 85·625 |
| Kitchenette ... ... | 79·75 | 84·8 |
| Larder ... ... | 2·52 | 13·75 |
| Bathroom and lavatory | (Combined) 46·0 | (Bathroom) 26·125 (Lavatory) 13·75 |
| Coal store ... ... | 4·6 | Nil |

VENTILATION

| | As Built | All-Gas |
|---|---|---|
| Lounge ... ... | Chimney breast, 9 in. ×9 in. | Flue blocks, 12 in. ×2½ in. |
| 1st bedroom ... | Nil | " " " |
| 2nd " ... | Nil | " " " |
| Kitchenette ... | Nil | Chimney breast, 9 in. ×9 in. |

COST, PER FLAT*

| | As Built £ s. d. | | All-Gas £ s. d. |
|---|---|---|---|
| Structure ... ... | 300 0 0 | Structure ... ... | 304 13 0 |
| (1) Combination fire-place with back boiler | 12 10 0 | (1) Gas cooker ... ... | 8 4 3 |
| (2) 20 gal. cylinder and piping ... ... | 9 10 0 | (2) Plate warmer ... | 2 0 9 |
| (3) 2 electric fires ... | 10 0 0 | (3) Gas water heater ... | 4 19 0 |
| (4) Wash boiler ... | 1 15 0 | (4) 30 gal. cylinder ... | 4 10 0 |
| | | Lagging ... ... | 1 7 6 |
| | | Piping ... ... | 2 10 0 |
| | | (5) Clothes dryer ... | 8 8 0 |
| | | (6) Water heater cabinet | 6 14 0 |
| | | (7) Canopy ... ... | 1 14 0 |
| | | (8) L. 220 refrigerator† ... | 21 8 1 |
| | | (9) Washing machine ... | 5 0 7 |
| | | (10) Lounge fireplace ... | 14 8 3 |
| | | (11) 1st bedroom ... | 3 10 0 |
| | | (12) 2nd " ... | 3 10 0 |
| | | (13) Kitchenette radiator... | 2 1 9 |
| Total ... ... | £333 15 0 | Total ... ... | £394 19 2 |

* Exclusive of site, sewers, road and services in each case (all costs as at September, 1939).

† Of the total extra cost of £61 4s. 2d., the L.220 refrigerator represents £21 8s. 1d. A refrigerator is at least equally desirable in the pre-1939 dwelling.

(The Author's acknowledgments and thanks are due to Mr. Philip Cussins, Director of Cussins (Contractors) Limited, for the loan of the plans upon which the "All-Gas" proposals are based.)

### (C) MEDIUM-PRICED SEMI-DETACHED VILLA

*Example:* Semi-detached villa at West Denton, Newcastle-upon-Tyne

DIMENSIONS, sq.ft.

| | As Built | All-Gas |
|---|---|---|
| Ground plan area ... ... | 630 | 630 |
| Dining room ... ... ... | 124·5 | 130·5 |
| Lounge ... ... ... | 174·5 | 178·5 |
| 1st bedroom ... ... ... | 116·50 | 121 |
| 2nd " ... ... ... | 132·50 | 132·50 |
| Nursery ... ... ... | 45·75 | 45·75 |
| Kitchenette ... ... ... | 94·84 | 107·1 |
| Larder ... ... ... | 6·56 | 9·00 |
| Entrance hall ... ... ... | 71·50 | 71·50 |
| Bathroom ... ... ... | 38·75 | 44 |
| Lavatory ... ... ... | 11·25 | 11·25 |
| Coal store ... ... ... | 12·00 | Nil |
| Tool house ... ... ... | 12·00 | 12·00 |

VENTILATION

| | As Built | All-Gas |
|---|---|---|
| Dining room ... | Chimney breast, 9 in. ×9 in. | Flue blocks, 12 in. ×2½ in. |
| Lounge ... ... | " " " | " " " |
| 1st bedroom ... | " " " | " " " |
| 2nd " ... ... | " " " | " " " |
| Nursery ... ... | Air brick | " " |
| Kitchenette ... | Chimney breast, 9 in. ×9 in. | Two flue blocks, 12 in. × 2½ in. each. |

COST*

| | As Built £ s. d. | | All-Gas Fuel £ s. d. |
|---|---|---|---|
| Structure ... ... | 501 9 5 | Structure ... ... | 473 17 10 |
| (1) Back-to-back range | 8 19 0 | (1) Mains 57 cooker ... | 12 1 2 |
| (2) 20 gal. cylinder and pipes ... ... | 9 14 7 | (2) Vertical plate warmer | 2 0 0 |
| (3) Lounge fire ... | 15 0 0 | (3) Water heater ... | 4 19 0 |
| (4) 1st bedroom fire ... | 4 12 0 | (4) 30 gal. cylinder ... | 4 10 0 |
| (5) 2nd " " ... | 3 10 0 | Lagging ... ... | 1 7 6 |
| (6) Gas boiler ... ... | 1 15 0 | Piping ... ... | 2 10 0 |
| | | (5) Clothes dryer ... | 8 8 0 |
| | | (6) Water heater cabinet | 6 14 0 |
| | | (7) Canopy ... ... | 1 14 0 |
| | | (8) L. 380 refrigerator† ... | 31 13 3 |
| | | (9) Kitchenette radiator... | 2 1 9 |
| | | (10) Washing machine ... | 5 0 7 |
| | | (11) Dining room fireplace | 13 19 8 |
| | | (12) Lounge fireplace ... | 14 8 3 |
| | | (13) 1st bedroom fireplace | 3 10 0 |
| | | (14) 2nd " " | 3 10 0 |
| | | (15) Nursery ... ... | 3 10 0 |
| Total ... ... | £545 0 0 | Total ... ... | £595 15 0 |

* Exclusive of site, sewers, roads, and services in each case (all costs as a September, 1939).

† Of the total extra cost of £50 15s. 0d., the L.380 refrigerator represents £31 13s. 3d. A refrigerator is at least equally desirable in the pre-1939 dwelling.

(The Author's acknowledgments and thanks are due to Mr. R. Burke, Architect and Surveyor, for the loan of the plans upon which the "All-Gas" proposals are based.)

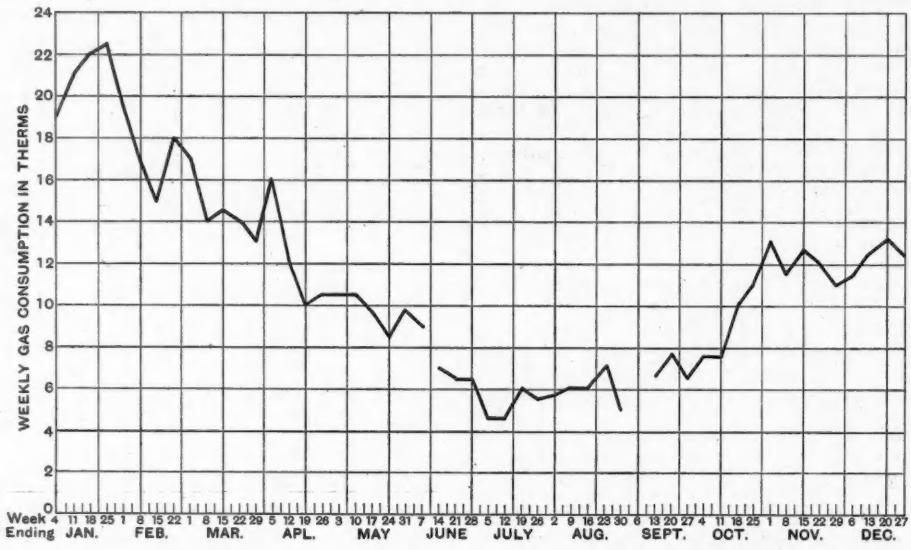
(D) WEEKLY "ALL-GAS" REQUIREMENT FOR MODIFIED VERSION OF FLAT B

Apparatus Installed :—

| | | |
|---|---|---|
| Living Room | ... | 9-rad. fire |
| 1st Bedroom | ... | 5-rad. fire |
| 2nd " | ... | Nil |
| Kitchen | ... | 5-rad. fire |
| | | Gas cooker |
| | | Refrigerator (L. 22) |
| | | Gas washer |
| | | Gas water-heater (30 cu.ft.) |
| Entrance Hall | ... | Gas radiator (12 cu.ft.) |

Number of Occupants ... Two adults
Total Annual Consumption ... 578 therms
Net Running Costs (as at Sept., 1939) :—

| | Therms | £ | s. | d. |
|---|---|---|---|---|
| Dec.-Mar. qtr. ... | 236·5 | 3 | 16 | 1 |
| Mar.-June qtr. ... | 154·5 | 2 | 9 | 11 |
| June-Sept. qtr. ... | 68·5 | 1 | 8 | 0 |
| Sept.-Dec. qtr. ... | 118·5 | 2 | 6 | 0 |
| | 578·0 | £10 | 0 | 0 |




with particulars of the cost of equipment, both gross and net after deduction of solid fuel equipment hitherto normally provided, and now proposed to be omitted. It should be emphasized that the equipment recommended will meet the post-war demand for a standard of comfort markedly superior to that of pre-war years, although, as already shown, no corresponding increase will occur in expenditure under fuel.*

Existing dwellings recently erected in the Newcastle district have been used as a basis for "all-gas" design.

In conclusion, two suggestions are offered:

1. That in post-war building the equipment should be regarded as an integral part of the fabric, should be supplied by the landlord and covered in the rental, just as is, for example, the bath or the kitchen sink today. (It will be observed, in this connexion, that nothing in these proposals precludes the free choice of either gas or electricity for any of the services provided, the spacing being suitable for either.)
2. That the Gas Industry should seek every opportunity of bringing these proposals (modified as may be necessary in the light of their discussion by the Industry) before the Royal Institute of British Architects, taking the views of that body upon them, and seeking its collaboration in securing the adoption of such proposals in the work ahead.

* See detailed record in Appendix of actual weekly consumptions of gas in typical "all-gas" non-parlour flat, occupied by a member of the staff of the Author's Undertaking.

# THE CONTRIBUTION OF THE GAS INDUSTRY IN THE DOMESTIC FIELD TO NATIONAL FUEL ECONOMY*

By HAROLD HARTLEY, D.Sc., M.Inst Gas E.,
Technical Director, Radiation Limited, Birmingham.

The whole question of the domestic use of fuel bristles with difficulties and complications, and it is probable there is no single solution of the domestic heat service problem which is likely to be adopted universally in a measurable period of time. The Gas Industry offers gas and coke. These fuels can satisfy the needs of all, and should suit the requirements of most people.

The expenditure necessary hitherto in order to obtain an adequate heat service in the home has, with the equipment provided, been so great as to be beyond the reach of those in the lowest income ranges, and for most "industrial" families has represented an appreciable proportion of the available earnings. Any development that will result in a lightening of this burden will be of real service to the nation.

### Household Use of Fuel

The following is an estimate of the "fuel" derived from natural sources which is used annually in the homes of the people in Great Britain:

| Fuel | Quantity Used | Approximate Equivalent in $10^6$ therms |
|---|---|---|
| (*a*) Coal | 35 mill. tons | 10,500 |
| (*b*) Anthracite | 1 mill. tons | 320 |
| (*c*) Coke | 2½ mill. tons | 870 |
| Coalite | ½ mill. tons | |
| (*d*) Town gas | 210,000 mill. cu. ft. | 1,000 |
| (*e*) Electricity | 7,500 mill. units | 250 |
| | | Say, 13,000 |

The provision of the foregoing involves the use of roughly 53 mill. tons of coal, of which the Gas Industry quota of 1,700 x $10^6$ therms satisfies some 20 per cent, and the electrical industry some 3 per cent, of the household needs for heat services.

Since the end of the last war, the household demand for coal appears to have remained stationary, whilst that for gas has increased by some 200 x $10^6$ therms, that for electricity

* Paper to the Institution of Gas Engineers, June 10. [Communication No. 248.]

by some 220 x $10^6$ therms, and that for coke and coalite has probably increased by some 500 x $10^6$ therms.

It is unlikely that a large proportion of the bituminous coal now used for domestic purposes can be replaced by anthracite and dry steam coal. The annual output of coal with a volatile content not exceeding 13 per cent is of the order of 10 mill. tons. To render these coals suitable for domestic use, they have to be broken and graded, thus making a substantial percentage of duff coal. If all the coal were treated in this way, the amount of sized coal available would probably be reduced to about 7½ mill. tons a year, although some of the duff could be restored to suitable sizes by conversion into carbonized ovoids. Substantial quantities of the smaller sizes are, however, already required for industrial purposes.

If the domestic smoke problem is to be tackled seriously, it will be necessary either to devise means of burning bituminous coal without producing much smoke, or to arrange for a considerable expansion of the output of the Gas Undertakings and of the coke-producing plants.

*Family Statistics*

The total population of Great Britain is assessed at 45 mill., and there are said to be between 12 and 12½ mill. families. Table 1 summarizes data collated by W. E. Le B. Diamond,* and is valuable in enabling the potential demand for domestic heat supplies to be assessed.

TABLE 1.—*Potential Demand in Great Britain for Domestic Heat Supplies*

| Income Range, per Week | Percentage of Total Number of Families | Sub-division of Estimated Domestic Gas Consumers | Estimated Average Annual Gas Consumption per Consumer |
|---|---|---|---|
| 1. | 2. | 3. | 4. |
| Over £10 | 5·2 | 435,500 | Ordinary domestic consumers—177 therms. |
| Over £4, less than £10 | 21·3 | 2,380,300 | |
| Over £2 10s., less than £4 | 37·8 | 4,081,000 | Prepayment consumers—80 therms. |
| Less than £2 10s. | 35·7 | 3,818,000 | |
| | 100 | 10,714,800 | |

The P.E.P. "Report on the Gas Industry" estimates the average annual consumption as 135 and 90 therms, respectively, for the two classes of consumer, and the total number of domestic gas consumers in 1937 as 9½ mill.

*Weekly Expenditure for Fuel, "Industrial" Families*

The average weekly expenditure on fuel and light amounted to 6s. 5d. among the 8,905 industrial households dealt with in the Ministry of Labour Report* on the survey made in the years, 1937/38. Some details are summarized in Table 2.

TABLE 2.—*Estimated Expenditure and Fuel Consumption of "Industrial" Families.*

| Weekly Expenditure | | Estimated Annual Consumption, therms |
|---|---|---|
| Coal (1·7 cwt. at 37s. 3d. per ton) ... | 3s. 2d. | 1,320 |
| Coke ... ... ... ... ... | 0s. 1d. | 30 |
| Gas (including meter and fitting rents)... | 1s. 5½d. | 83 |
| Electricity (including meter and fitting rents) ... ... ... ... ... | 11½d. | 5 |
| Oil, firewood, candles and matches ... | 8½d. | 12 |
| | 6s. 5d. | say, 1,450 |
| Rent and rates ... ... ... ... | 10s. 10d. | |
| Food ... ... ... ... ... | 34s. 1d. | |
| Total weekly expenditure ... ... | 86s. 3d. | |

In the lower income ranges, of those on the poverty line, the proportion of the income expended on fuel and light may be appreciably higher.

Isolated cases quoted in "Working Class Wives"† are as follow:

| Fuel | Average Weekly Expenditure | | | | |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Coal ... ... ... | 2s. 10d. | 3s. 0d. (2 cwt.) | 3s. 4d. | 3s. 0d. (2 cwt.) | 2s. 8d. |
| Gas and electricity ... | 1s. 3d. | 1s. 0d. | 3s. 0d. | — | — |
| Rent ... ... ... | 11s. 0d. | 12s. 6d. | 5s. 6d. | 4s. 6d. | 5s. 0d. |
| Total housekeeping ... | 39s. 0d. | 41s. 0d. | 36s. 9d. | 29s. 3d. | 35s. 0d. |

*Gas J., 1941, **235**, 397.
* Ministry of Labour Gazette, December, 1940.
† Rice, Margery S., (Pelican Books), Ch. 7.

The records published for Kensal House‡ show that each family spends on an average 4s. 4d. on gas, for cooking and supplying hot water, and on coke for space heating. The average coke consumption for space heating was 0·55 cwt. per week, or, say, 415 therms per annum, and that of gas 220 therms per annum. The gas was supplied at a commodity charge of 4d. per therm, with a weekly standing charge of 1s. 5d. which, on the consumption indicated, amounts approximately to another 4d. per therm.

THE EFFICACY OF APPLIANCES OPERATING ON SOLID FUEL, GAS AND ELECTRICITY

The data available of the fuel usage of various sections of the community are insufficient to enable a comparison to be made of the relative efficiencies attained in practice with appliances using solid fuel, gas and electricity. If a sufficiently large number of cases could be examined, the results would provide an indication of the position with the appliances installed. This would not, however, form a satisfactory basis upon which to decide the national policy for re-housing after the war. It is probable that, throughout the country, half the gas cookers and two-thirds of the electric cookers in domestic use are of the most modern design, whilst the majority of the solid fuel appliances are of older construction. It is in the development of the solid fuel appliances that the most rapid progress is being made at present. After the war there will be an increased demand for coal or coke ranges which can be kept alight day in and day out.

COOKING

*Gas*

It is estimated that at the end of 1939 there were some 7½ mill. gas cookers in use in households throughout Great Britain. The cooking load still represents the most important domestic use for gas, and in some large centres of population an average of about 90 per cent of the families use gas in some type of appliance for cooking. The thermostatically-controlled gas cooker, introduced about 20 years ago, is largely responsible for that improvement in the standard of cooking, noticeable throughout the country, to which reference was made recently by Miss Rebecca West.

The thermal efficiencies attainable with a modern cooker are as follow:

| | |
|---|---|
| Hotplate: | |
| Boiling ... ... | 40 to 50 per cent, depending upon the rating of the burner and conditions of use. |
| Grilling ... ... | 20 per cent radiant efficiency in steady state. |
| | 10 to 17 per cent efficiency in use, depending upon foodstuffs prepared. |
| Oven ... ... ... | 3 to 25 per cent, depending upon the type o. load and conditions of use. |

The gas burned at a cooker varies considerably throughout the year, and, even when the consumption is expressed as B.Th.U. per head, to a great extent between different families.*

It is not difficult to devise ample menus which can be prepared at consumptions varying between 4,000 and 5,000 B.Th.U. per person per day for a family of four. The cooker, however, is used for other purposes than the actual preparation of meals. There are, for example, a number of occasions on which boiling water is required, and, with a cooker in the house, it is generally obtained by the use of the hotplate.

The following record of consumptions, expressed as B.Th.U. per person per day, taken over a number of weeks in the case of a family of four, is quite typical:

(*a*) Preparation of four daily meals, including baking of cakes—5,140.
(*b*) As (*a*), plus gas consumed in heating water for shaving, making morning tea and other drinks between meals, hot-water bottles and stock simmering—6,170.
(*c*) As (*b*), plus water for laundering and preparation of food for animals—8,580.

In general, the consumption for cooking for a family of four, whose requirements necessitate, say, using the cooker 2½ hr. per day, will amount to 6,250 B.Th.U. per person per day (90 therms per annum), whilst in the case of a family of the same size with greater needs, involving the use of the

‡ Leslie, S. C., *loc. cit.*
* The records applying to two successive years, for 10 children's houses with approximately the same number of inmates, and the same diet, in a well-known Home, showed consumptions varying from 294 to 408 therms per annum, the average for each year being, however, 354 and 357 therms per house, respectively, equivalent to approximately 4,000 B.Th.U. per person per day.

cooker for say, 4 hr. per day, the consumption will average 10,000 B.Th.U. per person per day (150 therms per annum).

*Electricity*

It is estimated that there are 1·25 to 1·5 mill. electric cooking appliances of various types in use throughout this country, and that 25 per cent of the average domestic load is required for cooking. It is stated that, immediately prior to the war, electric cookers were being produced at the rate of 200,000 per annum, and that 70 per cent of the homes in Great Britain* are wired for electricity.

The thermal efficiencies attainable with a modern electric cooker are as follow:

| | |
|---|---|
| Hotplate : | |
| Boiling ... ... | 35 to 60 per cent, depending upon conditions of use. |
| Grilling ... ... | 30 to 35 per cent radiant efficiency in steady state. |
| | 15 to 25 per cent efficiency in use, depending upon foodstuffs prepared. |
| Oven ... ... ... | 5 to 25 per cent efficiency, depending on type of load and conditions of use. |

It has been claimed that food for a family can be prepared at a consumption of one unit per person per day. Such a figure would compare with the gas consumption figure of 4,000 B.Th.U. per person per day referred to earlier. A number of tests have been made, however, to compare the cost of cooking by gas and by electricity. It is generally accepted that 20 kWh yield the same result as one therm of gas. For conditions of use comparable to those considered in the previous section, the consumptions of energy in the electric cooker would correspond respectively to 4,300 and 6,900 B.Th.U. per person per day.

*Solid Fuel*

Statistics of the number of solid fuel appliances in households in this country are not available. J. G. Bennett* estimates that some 4 mill. combination grates are in use, which consume 15 mill. tons of bituminous coal annually. Very few have been designed to work with smokeless fuel. To these a large number of solid fuel ranges must be added. The majority of households in the country are provided with some form of cooking appliance designed to work with solid fuel, although in most cases the cooking is done on a gas or electric appliance.

A typical combination grate consumes coal at the rate of 3½ lb. per hr. during the cooking period, and at a rate of 5 lb. per hr. during heating-up. A comparable size of self-contained range of the lightly-insulated type, which will be popularized after the war, would burn fuel at the rate of 2¼ lb. per hr. during cooking and still permit of the burning of 4 lb. per hr. for quick heating of the oven, or for providing additional hot water when the damper is opened. Such an appliance can be kept alight over-night at a consumption of about ½ lb. per hr., and will operate on any solid fuel.

The heat balance shown in Table 3 refers to such a lightly-insulated range, designed to satisfy cooking demands and the need for hot water:

TABLE 3.—*Heat Balance of Lightly-Insulated Range.*

| | B.Th.U | Percentage |
|---|---|---|
| 1 | 2 | 3 |
| Fuel burned (coke) ... ... ... ... | 32,000 | 100 |
| Flue products ... ... ... ... ... | 6,887 | 21·5 |
| Loss in ash-pit ... ... ... ... ... | 1,500 | 4·7 |
| Used to maintain the hotplate heated ... | 8,488 | 26·5 |
| Dissipated from front, sides, back and bottom | 3,925 | 12·3 |
| In hot water leaving range ... ... ... | 11,200 | 35·0 |
| Temperature in oven (mercury-in-glass thermometer ... ... ... ... ... | 240° C. | |
| Maintenance : | | |
| Overnight consumption of coke ... ... | 9·6 lb. in 16 hr. | |
| Oven temperature at end of maintenance period, ° C. ... ... ... ... ... | 120. | |
| Heat transmitted to water during maintenance period, B.Th.U. ... ... ... | 38,000. | |
| Time to attain 240° C. in oven, starting from cold, min. ... ... ... ... | 30. | |
| Time to attain 240° C. in oven, starting from 120° C., min. ... ... ... ... | 20. | |

* Germany, 90 per cent; France, 95 per cent; Belgium, 81 per cent; Norway 69 per cent.; Denmark, 71 per cent.
* Private Communication.

In the case of such appliances designed for cooking alone, lower consumptions are recorded, and when catering for 4 to 8 persons a fuel consumption of only 12 to 14 lb. of coke per day is required. The consumption per person of solid fuel is more affected than that of gas and electricity by the size of the group for which the cooking is done—it would be very little more costly in solid fuel to cater for eight than for four people. With a family of four, the consumption for cooking alone approximates to 40,000 B.Th.U. per person per day.

Heat is transferred to the kitchen during the whole day, and, for the greater part of the year, this will serve a useful purpose. If similar temperature conditions are to be maintained in a working kitchen, with gas appliances only installed, some provision will be necessary for space heating.

## ROOM HEATING

*Gas*

There are no data available of the number of gas fires in use throughout this country, although the total must be well in excess of the 2 mill. listed in the Gas World Year Book. An extensive survey made in North London in 1937 by a special organization indicated that 17·2 per cent of the families visited were using gas for room heating.

The percentage thermal efficiencies attainable with modern appliances are as follow:

| | Radiant Type Fire | Convector Type Fire | Flueless Appliances |
|---|---|---|---|
| Radiant efficiency (bench) | 55 max. | 45 | 20–35 |
| Convected heat ... ... | — | 25 | 55–70 |
| Effective efficiency* ... | 45 | 60 | 90 |

By the combined use of a radiant gas fire and a flueless appliance, an effective efficiency varying between 45 and 90 per cent can be attained, depending upon the relative consumptions of the two types of apparatus. The adoption of such a combination has much to commend it where gas with a low sulphur content is available.

*Electricity*

There are no estimates available of the number of electric radiators in household use, but the total is high. The thermal efficiencies of the incandescent filament types are as follows:

| | |
|---|---|
| Radiant efficiency ... ... | 70 per cent. |
| Overall efficiency ... ... | 80-100 per cent., depending upon conditions of use. |

*Solid Fuel*

By far the most common type of room-warming apparatus is a grate or range heated by solid fuel. An open coal fire probably uses 2½ tons of coal per annum. It is estimated that immediately prior to the war open coke fires were being fitted at the rate of 50,000 per annum; these would use up to 1½ to 2 tons of coke each a year. In cold weather solid fuel fires are generally alight for 13 hr. per day or more. The radiant efficiency attainable in certain cases is low, but modern designs yield improved results. The percentage thermal efficiencies now attainable with various solid fuels may be summarized as follow*:

*Open Fire*

| Coal..... | Bituminous | Steam | Anthracite |
|---|---|---|---|
| Bench efficiency ... ... ... | 26–27 | 26–29 | 26–30 |
| Effective efficiency for 12 hr. use | 23 | 24 | 25 |

| Coke..... | Gas | Low Temperature |
|---|---|---|
| Bench efficiency ... ... ... | 32–35 | 27 |
| Useful efficiency for 12 hr. use ... | 28 | 24 |

*Convector Type Fire*

After the war, both coal and coke fires will be obtainable in a variety of designs suitable for use for 24 hr. per day.

* Davidson, W., and Hartley, H., *Trans. Inst. Gas Eng.*, 1938-39, **88**, 480.
* Davidson, W., and Hartley, H., *Trans. Inst. Gas Eng.*, 1938-39, **88**, 455.

Under prolonged conditions of use, the following percentage efficiencies are attainable:

| | Coal | Coke |
|---|---|---|
| Radiant heat ... ... ... | 20 | 25 |
| Convected heat ... ... ... | 30 | 35 |
| Effective efficiency ... ... | 50 | 60 |

At Kensal House, 0·55 cwt. of coke is burned per week per flat in a self-contained coke grate. The type used will have an effective efficiency of 40 per cent. On this basis the heat input to the room averages 45,000 B.Th.U. per day. For many middle-class houses it may be necessary to supply twice as much energy for heating.

## Water Heating

### *Gas*

It is not known how many gas-heated hot water appliances are in use throughout this country, although at a conservative estimate these must exceed a million, excluding wash coppers which are largely used by the poorer class gas consumer for producing hot water in bulk. The North London Survey, to which reference has been made already, indicated that 51·8 per cent of the families visited were using gas for heating bath water and 34·9 per cent for heating laundry water.

When used to give an output for which they are designed, the multi-point insulated storage and instantaneous heaters show little difference in effective efficiency. The most economical results can be attained with single-point heaters fitted in close proximity to the position at which the water is required.

If the hot water demand amounts to 300 gal. per week, it would be expected that the multi-point heater would have an effective efficiency* of 55 per cent, whilst for an output of 600 gal. per week, this would probably increase to 60 per cent. With a single-point heater, an efficiency of 70 per cent would be attained.

For the supply of boiling water, the cooker hotplate or a gas copper is employed. For each appliance an effective efficiency of 45 per cent can be assumed.

### *Electricity*

It is claimed† that by the end of 1938, there were 534,000 electrically-operated water heaters in use. The most serious effort to meet the domestic hot water demand is made by installing immersion heaters in storage tanks. Such heaters are in general not rated at more than 5 kWh (17,060 B.Th.U. per hr.). Excluding losses from the surface of the tank, the efficiency of transmission of energy to the water is of the order of 95 per cent. If the heater is used during the night and the storage tank is suitably insulated and large enough to satisfy the day's demands, then an effective efficiency of 70 per cent should be attained for an output of 300 gal. per week, and of 75 per cent for an output of 600 gal. per week.

### *Solid Fuel*

The majority of kitchen ranges are fitted with a back boiler. When used to produce hot water only, the thermal efficiency is low, only about 25 per cent of the energy in the fuel being transmitted to the water in the boiler itself.

The open coke or coal fire fitted with a back boiler has increased in popularity of recent years. When used for the production of hot water, such a combination will yield an efficiency of transfer to the boiler itself of 23 per cent with coal and 28 per cent with coke. With combination grates the corresponding efficiencies are 30 and 35 per cent respectively.

With self-contained ranges fitted with water heaters, about 30 per cent of the energy generated is transmitted to the water when operating with bituminous coal, and 35 per cent when working with coke. With the damper open to accelerate hot water production, the percentage heat transfer increases to 40 per cent with coke.

With the independent boiler, the efficiency of transfer attained with bituminous coal probably does not exceed 35 per cent, whilst with anthracite, over a wide range of combustion rates, an average efficiency of 47 to 48 per cent is attained, and with coke, 55 per cent.

When solid fuel is used for heating water, it is not the common practice to insulate the pipes and cylinder. This can be done in many cases, and it is probable that after the war the heating appliance will be designed for use with insulated circulating systems.

Under ordinary conditions, when the circulating system is not insulated, approximately one-half of the heat transferred to the boiler is found in the water as used. With an insulated system this proportion would probably be increased to 75 per cent. For larger domestic installations, thermostatic control is obtainable with solid fuel appliances.

## Family Needs for Hot Water

In the case of families with small incomes, the hot water usage has in the past been kept at a minimum. The North London Survey indicates that complete washing of the body is limited to once per week per adult, and of the people visited only a small proportion had access to a bath.

S. C. Leslie reports for Kensal House* a hot water usage of 150 gal. a week, and, in his memorandum, draws attention to a recommendation of a Ministry of Health Committee that it was desirable that this should be increased to 300 gal. per week. The use of hot water should be encouraged, and, in general, more is available for families who have a suitable solid fuel appliance, be it a back boiler in a living room grate, a kitchen range, or a self-contained boiler. Where it is necessary to depend on a gas copper, or an instantaneous heater delivering a mere trickle of hot water, the family are not likely to be encouraged to take more baths. For a family of four, consisting, say, of the parents, an adolescent and a baby, it is suggested they should be in a position to afford an average daily usage of 35 gal. of water raised 90°F. and 3 gal. of water raised 160°F., representing in all, say, 37,000 B.Th.U. per day in the hot water at the point of usage. For a middle-class family of four adults, including a maid, the daily supply should be more than double this figure, at, say, 75,000 B.Th.U. per day in the hot water at the point of usage.

## Cost of Providing Heat Services

In Table 4 is summarized the daily cost of providing heat services for two types of family. Case A is taken to represent the service which should be within the reach of a working-class household. Case B is for a middle-class family living somewhat more extravagantly. The bases of the figures are those indicated in the preceding pages and are as follow:

*Heat Services Allocated*

Case A: *Cooking*—2½ hr. per day.
Solid Fuel—Three 20-min. periods for heating-up prior to cooking
Gas Consumption—6,250 B.Th.U./person/day.
Electricity Consumption—4,300 B.Th.U./person/day.
*Water-Heating*—37,000 B.Th.U./day available at tap.
*Space-Heating*—40,000 B.Th.U./day effective.

Case B: *Cooking*—4 hr. per day.
Solid Fuel—Three 20-min. periods for heating-up prior to cooking.
Gas Consumption—10,000 B.Th.U./person/day.
Electricity Consumption—6,900 B.Th.U./person/day.
*Water-Heating*—75,000 B.Th.U./day available at tap.
*Space-Heating*—60,000 B.Th.U /day effective.

*Fuel Costs*

Coal—40s. per ton. C.V. 13,000 B.Th.U. per lb.
Coke—40s. per ton. C.V. 13,000 B.Th.U. per lb.
Gas—4d. per therm with 2½d. per day standing charge.
Electricity—½d. per B.O.T. Unit with 2½d. per day standing charge.

If an auxiliary gas circulator be fitted in schemes 4, 5, 6,

* Heat in water delivered to required point.
† *Electrical Trading*, 1939, **10**, No. 118, p. 45.

* *loc. cit.*

TABLE 4.—*Estimated Daily Cost of providing Heat Services for a Family of Four Persons*

| Scheme No. | Costs, pence per day. | CASE A | | | | | CASE B | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cooking, 2½ hr. | Water-Heating: 37,000 B.Th.U. at tap | Space-Heating: 40,000 B.Th.U. "useful" | Standing Charge | Total | Cooking 4 hr. | Water-Heating: 75,000 B.Th.U. at tap | Space-Heating: 60,000 B.Th.U. "useful" | Standing Charge | Total |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | Combination Grate ... (*a*) using coal | | 6.7 | | — | 6.7 | | 9.3 | | — | 9.3 |
| | (*b*) using coke | | 6.2 | | — | 6.2 | | 8.2 | | — | 8.2 |
| 2* | Self-contained solid-fuel cooker with boiler + open fire ... (*a*) using coal | | 4.3 | 3.6 | — | 7.9 | | 7.8 | 4.7 | — | 12.5 |
| | (*b*) using coke | | 4.3 | 3.1 | — | 7.4 | | 6.9 | 3.8 | — | 10.7 |
| 3* | Self-contained solid-fuel cooker with boiler + convector fire (*a*) using coal | | 4.3 | 2.0 | — | 6.3 | | 7.8 | 2.3 | — | 10.1 |
| | (*b*) using coke | | 4.3 | 1.8 | — | 6.1 | | 6.9 | 1.9 | — | 8.8 |
| 4* | Self-contained solid-fuel cooker + independent boiler + open fire | | | | | | | | | | |
| | (*a*) using coal | 3.0 | 3.4 | 3.6 | — | 10.0 | 3.4 | 6.9 | 4.7 | — | 15.0 |
| | (*b*) using coke | 3.0 | 2.2 | 3.1 | — | 8.3 | 3.4 | 4.5 | 3.8 | — | 11.7 |
| 5* | Self-contained solid-fuel cooker + independent boiler + convector fire | | | | | | | | | | |
| | (*a*) using coal | 3.0 | 3.4 | 2.0 | — | 8.4 | 3.4 | 6.9 | 2.3 | — | 12.6 |
| | (*b*) using coke | 3.0 | 2.2 | 1.8 | — | 7.0 | 3.4 | 4.5 | 1.9 | — | 9.8 |
| 6* | Gas cooker + independent boiler + open fire ... ... ... (*a*) using coal | 1.0 | 3.4 | 3.6 | 2.5 | 10.5 | 1.6 | 6.9 | 4.7 | 2.5 | 15.7 |
| | (*b*) using coke | 1.0 | 2.2 | 3.1 | 2.5 | 8.8 | 1.6 | 4.5 | 3.8 | 2.5 | 12.4 |
| 7* | Gas cooker + independent boiler + convector fire ... ... (*a*) using coal | 1.0 | 3.4 | 2.0 | 2.5 | 8.9 | 1.6 | 6.9 | 2.3 | 2.5 | 13.3 |
| | (*b*) using coke | 1 0 | 2.2 | 1.8 | 2.5 | 7.5 | 1.6 | 4.5 | 1.9 | 2.5 | 10.5 |
| 8* | Gas cooker + open fire with back boiler | | | | | | | | | | |
| | (*a*) using coal | 1.0 | 5.6 | | 2.5 | 9.1 | 1.6 | 10.8 | | 2.5 | 14.9 |
| | (*b*) using coke | 1.0 | 4.5 | | 2.5 | 8.0 | 1.6 | 8.6 | | 2.5 | 12.7 |
| 9* | Gas cooker + gas water-heater + open fire | | | | | | | | | | |
| | (*a*) using coal | 1.0 | 2.7 | 3.6 | 2.5 | 9.8 | 1.6 | 5.0 | 4.7 | 2.5 | 13.8 |
| | (*b*) using coke | 1.0 | 2.7 | 3.1 | 2.5 | 9.3 | 1.6 | 5.0 | 3.8 | 2.5 | 12.9 |
| 10 | Gas cooker + gas water-heater + convector fire ... ... (*a*) using coal | 1.0 | 2.7 | 2.0 | 2.5 | 8.2 | 1.6 | 5.0 | 2.3 | 2.5 | 11.4 |
| | (*b*) using coke | 1.0 | 2.7 | 1.8 | 2·5 | 8.0 | 1.6 | 5.0 | 1.9 | 2.5 | 11.0 |
| 11 | All gas: cooker + water-heater + radiant fire ... ... ... ... ... | 1.0 | 2.7 | 3.8 | 2.5 | 10.0 | 1.6 | 5.0 | 5.7 | 2.5 | 14.8 |
| 12 | All gas: cooker + water-heater + convector fire ... ... ... ... ... | 1.0 | 2.7 | 2.7 | 2.5 | 8.9 | 1.6 | 5.0 | 4.0 | 2.5 | 13.1 |
| 13 | All electric: cooker + water-heater + radiator ... ... ... ... ... | 2.5 | 7.8 | 5.9 | 2.5 | 18.7 | 4.1 | 14.7 | 8.8 | 2.5 | 30.1 |

* By insulating the hot-water systems, 18,500 and 37,500 B.Th.U. will become available daily in the respective cases for additional background heating without any reduction in the hot water available at the taps.

7 and 8, with suitable insulation, the cost of obtaining the hot water service will be as in schemes 9 to 12.

It is estimated that on the basis of the expenditure referred to in Table 2 (Ministry of Labour Survey) the cost of attaining the heat services was 9d. per day.

If in Table 4 the solid fuel cost adopted had been 37s. 3d. per ton, as in the Ministry of Labour Report, all solid fuel costs would be reduced by 7 per cent.

It will be seen that, on the cost bases adopted for the fuels, a really good service should be within the reach of all classes of the community. If it should be felt that the allocation of hot water is excessive, then it would be a simple matter to use a portion of the energy available directly as hot water and the remainder for background heating, by the provision of suitable "radiating" surfaces. In the case of the solid-fuel schemes, more energy would be available at the radiators by insulating the principal flow and return pipes and the hot water cylinder.

A standing charge of 2½d. per day is assumed for all gas and electrical installations. Such a charge should cover the capital cost involved in providing the gas or electric service. It is not intended to cover the charge for appliances, and no corresponding capital charge has been adopted for apparatus used in those cases where the services are obtained from solid fuels. It would, however, be a simple matter to make a suitable allocation, if this were desired.

## CONCLUSION

Before the war, town gas was used by the majority of families for some purpose or other, and, even where the equipment in the house included solid-fuel cooking apparatus, the majority of people employed gas for the preparation of meals.

For space-heating, gas is used today principally when an intermittent service is desired, the majority of people relying on solid-fuel heaters for obtaining the bulk of the heat. The most economical service is obtained with coke. If it becomes the general practice to supply town gas by means of a two-part tariff, with a relatively low commodity charge, a considerable extension of the use of the fuel for this purpose may be anticipated confidently. It is to be expected, in the first instance, that there will be a considerable extension of the use of town gas in middle-class households.

The domestic water-heating field is satisfied chiefly by the use of solid fuel and, during the present century, there has been a considerable extension in the use of coke appliances for this purpose. The Author would urge the desirability of paying greater attention to the preparation and supply of a graded coke of uniform quality for the domestic markets throughout the country.

For many years to come, large amounts of bituminous coal will be used in the home. Unless means are found of burning bituminous coal smokelessly in domestic appliances, the only real hope of effecting smoke abatement will depend on an extension of the activities of the Gas Industry and the allied coking industries. To replace all bituminous coal by gas and coke will involve a considerable enlargement of the capacity of carbonizing plants, and it is felt that much can be done in this direction by amicable arrangement with the coal interests. At present, bituminous coal is used to satisfy more than 60 per cent of the domestic needs.

There will always be some people who will use electricity for all domestic services. The present indications are, however, that there should not be a considerable development of the "all-electric" house.

Today the Gas Industry ranks second only in importance to the coal industry as the supplier of heat for the home, but, if a suitable price structure can be adopted universally, the Gas Industry should, within the life-time of many of those at present engaged therein, attain the predominant position. Unless gas can be supplied to the domestic user at a low commodity rate, however, the Gas Industry will stagnate.

## Personal

Mr. ERNEST ASTBURY, M.I.Mech.E., Chief Engineer and Chief Executive Officer of the Liverpool Gas Company, received in the Birthday Honours List the award of the Order of the British Empire for services to Civil Defence.

* * *

Sir FRANCIS JOSEPH, President of the Society of British Gas Industries, received a Baronetcy in the Birthday Honours List.

* * *

The Lord Provost's Committee of Dundee Town Council unanimously recommended on June 8 that Mr. JAMES DICKSON be appointed Gas Engineer and Manager in succession to Mr. John Wilson, whose death took place recently. Mr. Dickson, Assistant Gas Manager, previously held appointments at Forfar, Broughty Ferry, Dunfermline, Kelty, and Johnstone, going to Dundee in 1924.

* * *

At a gathering of staff and pensioners on June 9, Mr. E. SMALLBONE, who has been in charge of the Broadstairs Gas Company for the past 21 years and who was appointed to the Folkestone Gas Company in March, was presented with some cut-glass ware, together with a set of Shakespeare's works for his daughter. Mr. Arthur Wells, successor to Mr. Smallbone at Broadstairs and Herne Bay, and Mr. G. S. Wareham, Secretary, were introduced and welcomed by the Company.

* * *

At a recent Board Meeting of the Cheltenham and District Gas Company Major JULIAN DAY, M.C., was elected Chairman, and Mr. H. LESLIE BOYCE, M.P., was appointed a Director.

* * *

Mr. H. FORTESCUE FLANNERY, M.B.E., Assoc.M.Inst.C.E., M.I.N.A., has been appointed a Director of the Commercial Gas Company in the place of the late Mr. Harold Murphy, K.C.

* * *

Recently a pre-war member of the Parkinson Stove Company staff, Sergt. DENIS HORWOOD, R.A.F. Wireless Operator and Air Gunner, was decorated by the King with the D.F.M. for conspicuous gallantry in the course of his duties. On the following day a large and enthusiastic gathering of workpeople assembled to witness a presentation to Sergt. Horwood, on their behalf, by Mr. R. J. Rogers, Managing Director, who congratulated Sergt. Horwood upon his brave performance, and asked him to accept a silver cigarette case, suitably engraved, together with 40 National Saving Certificates on behalf of the Parkinson Company.

## National Gas Council

A meeting of the Central Executive Board of the Council was held on June 9 at Gas Industry House. Pending the election of a Chairman, the Chair was taken by Mr. FRANK JONES, M.Inst.C.E., J.P.

Mr. George Dixon, of Nottingham, was unanimously appointed an additional Member of the Coal Committee of the Conjoint Conference of Public Utility Associations as representing Gas Interests.

A List of Members of the Central Executive Board for 1942–43 was submitted. It was also announced that, since the last meeting, Mr. C. H. Chester, of Swindon, had been appointed to take the place of Mr. William Cash, as representing the Southern District Executive Board.

Sir David Milne-Watson, Bart., LL.D., D.L., was unanimously re-elected Chairman of the Board for the ensuing year.

The retiring Vice-Chairmen, Mr. Frank Jones and Major G. H. Kitson, were unanimously re-elected Vice-Chairmen for the ensuing year. The resignation of Alderman J. H. Lloyd was received with regret, and it was unanimously agreed that a letter be sent to him conveying the Board's good wishes and appreciation of the long and valuable services he had rendered to the Gas Industry.

As the Auditors had been unable to present their Statement in time for consideration by the Board, it was agreed to leave the matter with the Finance Committee, and to publish the Accounts in the Council's Report for the month of June.

A brief report was received on the general coal position.

A small representative committee was appointed to act as an Advisory Committee to the Public Utilities Coal Committee on the matter of gas oil.

Mr. E. V. Evans, Vice-Chairman of the National Gas and Electricity Committee, gave a brief report of the proceedings of the Committee since the last meeting, and stated that the Committee were now awaiting the result of the debate that was taking place in the House of Commons on the White Paper on Coal just issued, which incorporated in an annex what was substantially the Beveridge Scheme of Fuel Rationing.

Reference was made to the Campaign for Voluntary Fuel Economy initiated by Lord Kemsley, which led to the statement of policy by the gas and electricity interests, in which they undertook to recommend undertakers in suitable cases to permit their domestic consumers to transfer, if they wished so to do, to their alternative tariffs or flat rate charges for the period during which the necessity for fuel restriction remains.

The date of the next meeting was fixed for July 14.

## Fuel Rationing

Last Thursday the House of Commons gave its approval to the White Paper setting out the Government's plan of control of the coal industry and its proposals regarding fuel rationing, but the speeches of Mr. Dalton and Sir Stafford Cripps were regarded by many as having raised doubts as to whether, if compulsory rationing is decided on, the House will be permitted to amend as well as to discuss the scheme. In the meantime the provisional preparations for fuel rationing and the making of household assessments will proceed on the basis of the scheme laid down in the annex to the White Paper (see last week's "JOURNAL").

On June 10 Sir John Anderson stated in the House that on the consumption side there were certain savings that could and would be effected by eliminating exports that were not absolutely necessary. It was hoped to effect a material saving—indeed this was already being done—in industrial consumption by the introduction of improved methods of using coal and by developing, industry by industry, a system of allocating coal in the same way as raw materials were allocated. Finally there was the question of saving in domestic consumption. Now the balance to be struck was this: If reorganization gave the results hoped for, if in the first instance we succeeded in arresting the fall in output with some margin on the right side, and if, in one way or another, we could save on the domestic consumption something of the order of 6,000,000 tons, we should be able to get through the winter and finish with stocks on a safe level and with a sufficient margin for certain contingencies of which account had to be taken.

Commenting on the change, *The Times* of June 12 said: "No longer are domestic consumers asked to save 10,000,000 tons in the year. The requisite saving is reduced to 6,000,000, or only three-fifths of the original amount; and the difference may allow of alterations of the basic ration that will greatly ease the application of the scheme."

In the debate on June 11 the President of the Board of Trade said that the Government had gone a considerable distance to meet the views expressed in various parts of the House regarding fuel rationing. The Government would do its utmost to give full support to a sustained campaign designed to secure voluntary reduction on a large scale. But the Government had decided that, although compulsory rationing was not to be immediately introduced, all necessary administrative preparations must be made at once. The Government had definitely come to the conclusion that the scheme in the annex to the White Paper was the best available.

Sir A. Southy asked if, in the event of compulsory rationing, the whole of the scheme would be debated on its merits.

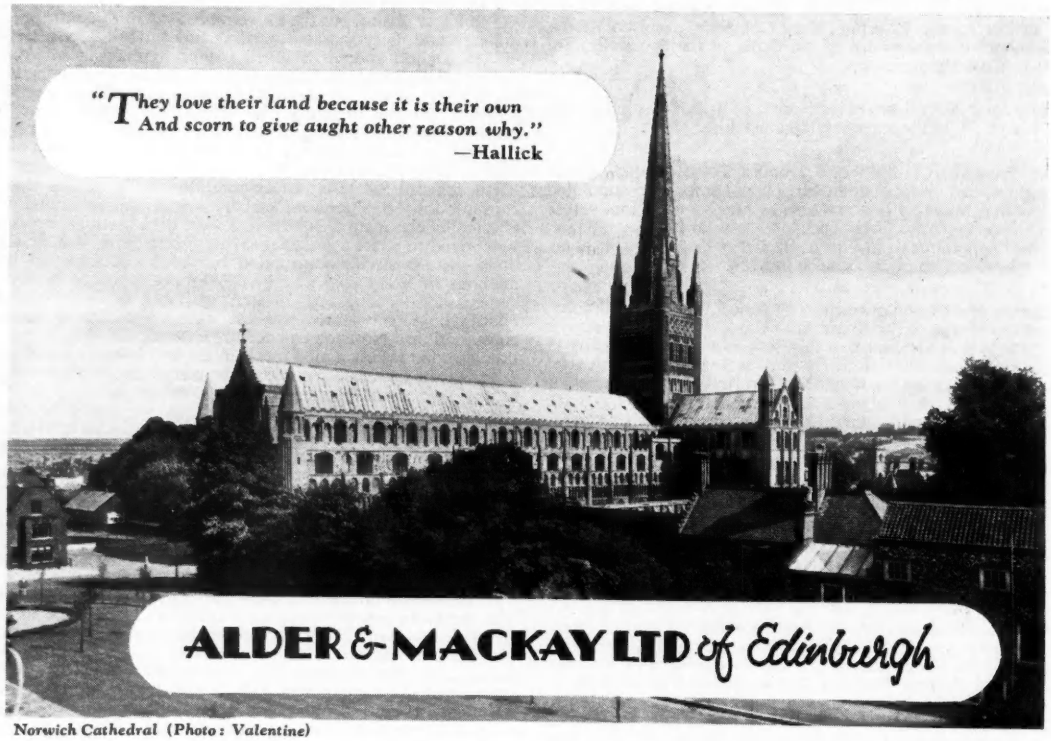
Mr. Dalton said that would evidently be the purpose of the discussion. If the debate took place he imagined it would be in order for members either to oppose rationing altogether or to raise points of detail as to the method of rationing proposed by the Government.

Sir Stafford Cripps, giving reasons why it had been decided to give domestic rationing a second place for the time being, said that they wanted a chance to see if the reorganization scheme would produce sufficient results. Replying to an intervention, he said that if it were decided to introduce rationing the House would have an opportunity of discussing the proposed plan and of making suggestions, but the Government did not intend to put before Parliament a Bill to which amendments could be put on the order paper.

## Parkinson & Cowan, Ltd.

Presiding at the 42nd Annual General Meeting of Parkinson & Cowan, Ltd., in London on June 9, Lieut.-Col. H. W. Woodall, C.I.E., M.Inst.C.E., said the net profit for the year ended Dec. 31, 1941, was £45,395, against £55,843 in 1940. The 1940 figure, however, included a profit of £45,824 on the sale of an Australian investment. The real improvement in trading results was more truly reflected in the dividends and interests from subsidiaries in the Profit and Loss Account, amounting to £60,986, against £23,752 a year ago. Income tax reserves had necessitated drawing on the year's profits by approximately £47,000. A bank overdraft of £12,312 appearing in the Balance Sheet had been obtained in view of the impossibility of transferring from Australia to this country fairly large sums of money deposited there. These deposited funds had been invested in Commonwealth Stocks. There was an increase of £27,143 in investments in subsidiary companies, representing the cost of acquisition from a subsidiary company of the entire share capital of an associated company in Australia. The undivided profits in the subsidiaries were up by £2,467 and now stood at £54,820.

After paying the 5% ordinary dividend recommended in the Directors' report, and putting £5,000 to Reserve Account, bringing the reserve up to £120,000, or approximately one-tenth of the paid-up capital, the carry-forward at £36,355 was increased by £4,041. The reputation established in peacetime for the Company's products was being fully maintained, and although work on post-war products had had to be temporarily suspended they were still keeping in touch with their peacetime business friends, who appreciated the difficulties with which they were confronted. Thanks were more than ever due to the management, staff, and workpeople for the admirable showing made in spite of all the trials and difficulties encountered.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And scorn to give aught other reason why."
—Hallick
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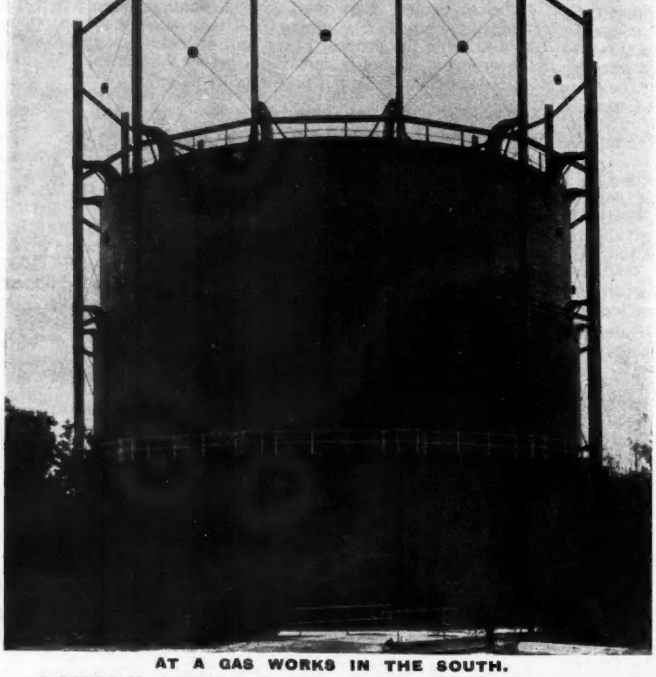
*Norwich Cathedral (Photo: Valentine)*



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# Post War Planning*

By A. P. McINNES, Dumbarton

POST-WAR planning is as necessary to an industry as victory is to a nation. A general does not wait for the battle before preparing his strategy, and there is no doubt that the Gas Industry will have to face in the future keener competition from electricity, coal, oil, and producer gas.

A cheap therm is not the only factor. I should much prefer to sell gas at an attractive price, plus a good service, rather than sell a cheap therm with poor service. The low flat rates existing prior to the war prevented the introduction of the ultimate low rate comparable with electrical charges, and I do feel that P.W.P. cannot neglect this opportunity of retaining a higher first charge to cover standing charges, with a lower price per therm to follow for additional consumption.

Recent years have seen a considerable improvement in advertising. The introduction of Mr. Therm was, in my opinion, the most effective effort by the Gas Industry to bring gas before the public. Yet we fell short. There are many people who, if asked about Mr. Therm, would have to search their minds. I feel that national, regional, and local advertising has failed to drive the pointer home if there exists anyone in ignorance of Mr. Therm. Millions of people read the Glasgow daily and weekly newspapers, yet how often in the past have we seen a gas advertisement in their pages? Surely some scheme of co-operative advertising could be devised by, and to the common benefit of, all undertakings in this district.

Practical salesmanship in many undertakings still has the tendency to remain behind the showroom doors, and although the showroom cannot be neglected, a more direct approach to the district is essential. Undertakings which have adopted a system of planned district selling have proved beyond doubt that this is the most successful method. Many opinions have been expressed in the past concerning the most suitable type of salesman. My opinion is that a fitter, if adaptable, with a course of sales training, gives the best service to consumer and undertaking. His knowledge of installation and previous contact with the consumers prove invaluable.

The acceptance of even one gas appliance means a gas service to the building, and this to a gas undertaking is a foundation on which to build. Opinion varies on the advantages of installing free points. My policy would be to install a free point to a convenient position on each floor. I look back with regret to the many sales of appliances lost through the lack of a convenient gas point.

Regarding standardization, surely a range of, say, four standard type cookers of modern design and high efficiency could be agreed upon, leaving the manufacturer a free market for new and improved design—any outstanding development in design and efficiency to be incorporated in the standard model in say three or five years' time. Many of our larger undertakings adopted a standard type of cooker twenty or more years ago and still distribute the same type to-day, in no way helping the prestige of gas in their area. The capital outlay on a free-loan policy is perhaps to blame.

Should standardization lead towards simplicity in maintenance, then a definite advantage would accrue. Unless maintenance staffs are properly trained and work to a prepared scheme, they can at the best only become "complaint curers," and not real maintenance staff. Appliances have become more intricate, and skill is required. If future loads are to be retained and increased, appliances must be maintained. All advertising, publicity, and sales talk can be undone by a few neglected appliances.

* From a Paper to the Scottish Junior Gas Association (Western District).

## A Royal Visit

H.R.H. The Duke of Kent honoured the Sheffield and District Gas Company with a visit on Friday last. He inspected the Gas-Works and afterwards visited the Head Offices of the Company.

He was accompanied by his Equerry, Squadron-Leader Ferguson, and conducted on his tour of inspection by Lieut.-Col. Sir Henry K. Stephenson, Bart., D.S.O., LL.D., the Chairman of the Company, Mr. Ralph Halkett, Director and General Manager, and Mr. Ralph Halkett, Jun., Secretary and Assistant General Manager. Other Directors present were Mr. R. G. Blake, the Deputy Chairman, the Rt. Hon. Lord Riverdale, and Mr. W. W. Wood, the Master Cutler.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in the "Journal" should not be taken as an indication that they are necessarily available for export.

## Yorkshire Junior Gas Association

A Meeting of the Yorkshire Junior Gas Association was held at the New Wortley Works of the City of Leeds Gas Department on May 16.

The President, Mr. T. G. Lewis, in opening the meeting welcomed several Engineers and Managers of the Yorkshire District. Mr. J. E. Lister-Cooper, President of the Manchester District Association of Gas Engineers responded.

Mr. L. Hartley, Managing Director of Messrs. Clayton, Son & Co., Leeds, addressed the meeting on the subject of "Gasholders—Emergency Repair Problems in Wartime," illustrating his remarks by drawings and photographs. A keen interest was taken in the subject, and Mr. Hartley was called upon to answer a number of questions.

Mr. C. S. Shapley, Leeds, proposed a vote of thanks to Mr. Hartley, and in the course of his remarks spoke of the Gas Industry and the proposed fuel rationing scheme. Mr. J. W. Holroyd, Rotherham, seconded and Mr. H. E. Bloor, York, supported.

Mr. Hartley, on behalf of Messrs. Clayton, Son & Co., presented the Clayton Medal to Mr. R. Anderson, of Bradford, for his Paper entitled "Gas Heating Installations in Bradford," read before the Association during the session 1938–39.

Unfortunately, Mr. S. H. Stokes, Mid-Cheshire Gas Company, and late of Elland, Yorkshire, could not be present to receive the Clayton Medal awarded for his Paper "Economic Utilization of Unscreeened Coke Breeze," read before the Association during the session 1939–40.

Mr. R. N. Webb, of Barnoldswick, presented his award for the best Short Paper read before the Association, 1939–1940. The recipient was Mr. J. Hargreaves, of Bradford.

A vote of thanks to Mr. C. S. Shapley and the Gas Committee of the City of Leeds Corporation for their kindness in providing facilities to enable the Association to hold the meeting was proposed by Mr. V. J. J. Siddons and seconded by Mr. E. Bailey.

The meeting closed the session, and the Annual General Meeting will be held early in October.

**Neil & Mostyn, Ltd.,** manufacturers of the "Walsh" all-steel collapsible gas container, advise us of the opening of new London Offices at 262, Clapham Road, S.W. 9, telephone Macaulay 1252/3.

**The Ministry of Works** announces that the Licensing Officer for the London Civil Defence Region has moved from Abell House. Application for building licences in this region should now be addressed to The Licensing Officer, Ministry of Works and Buildings, 51/54, Gracechurch Street, London, E.C. 3.

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# Gas Products Prices

### The London Market June 15.

The only change in the prices of Coal Tar Products in the London Market refers to 95/160 Solvent Naphtha, which is now about 2s. 3d. to 2s. 7d. per gallon.

### The Provinces June 15.

The average prices of gas-works products during the week were: Pitch and Crude Tar,* Toluole, naked, North, 90's, 1s. 10d., pure, 2s. 5d. (controlled by the Control of Toluene No. 2 Order, July 3, 1941, which fixes the maximum price at which this material may be sold). Coal tar, crude naphtha, in bulk, North, 1s. to 1s. 4d. according to quality. Solvent naphtha, naked, North, 2s. 2d. to 2s. 6d. Heavy naphtha, North, 1s. 10d. to 1s. 11d. Carbolic acid, 60's, controlled by the Coal Tar Acids Prices (Inland) Order, 1942, operative from May 1. Naphthalene, controlled by the Naphthalene prices (Inland) Order, 1942, dated April 15, 1942, and operative from May 1) 1942, £19 to £19 10s.—bags free. Anthracene, controlled by the Anthracene Prices (Inland, Order, 1942, operative from May 1. Filtered heavy oil (min. gr. 1,080), 7½d. to 8d.

*In regard to pitch and crude tar prices we would ask readers to refer to the editorial note on p. 396 of the "JOURNAL" for Sept. 10, 1941.

### Tar Products in Scotland June 13.

All products in good demand. Refined tar controlled. Value about 4½d. per gallon *ex* Works, naked. Creosote oil: Specification oil, 6¾d. to 7d.; low gravity, 7¼d. to 7½d.; neutral oil, 6¾d. to 7d. per gallon; all *ex* Works in bulk. Cresylic acid: Demand continues strong. Prices from 3s. 6d. to 5s. per gallon, *ex* Works, naked. Crude naphtha 6½d. to 7d. Solvent naphtha: 90/160 grade, 2s. to 2s. 3d., and 90/190 Heavy Naphtha, 1s. 9d. to 2s. per gallon. Pyridine: 90/160 grade, 13s. and 90/140 grade, 15s. per gallon.

# Gas Stocks and Shares

The Gas Market was no exception to the general situation last week, and again a large number of issues appreciated in value. The volume of business, too, was on a heavier scale than for the past few weeks. The stocks of the Metropolitan Companies were in particularly good demand, and all three were marked up. It will be noticed that Imperial Continental again improved last week by no less than 7 points, and some sharp rises were recorded in the Supplementary List, including Tunbridge Wells sliding scale which closed 25 points higher, and Cheltenham ordinary with a gain of 12.

The following price changes took place during the week:

**OFFICIAL LIST**

| | | |
|---|---|---|
| Alliance & Dublin ... ... ... | 94—99 | —1 |
| Associated Gas & Water Undertakings Ord.... ... ... ... | 16/—17/— | +—/6d. |
| Bournemouth max. Div. ... ... | 125—130 | +2 |
| Colombo 7 p.c. Pref. (*x.d.*) ... | 19/—21/— | June 8 |
| Commercial ... ... ... ... | 33—38 | +1 |
| Ditto 3 p.c. Deb. (*x.d.*) ... ... | 58—63 | June 8 |
| Ditto 5 p.c. Deb. ... ... ... | 95—100 | +2 |
| Gas Light Units ... ... ... ... | 13/6—14/6 | +—/3d. |
| Ditto 4 p.c. Pref. ... ... ... | 66—71 | +2 |
| Ditto 3⅜ p.c. Red. Pref. ... ... | 72—77 | +1 |
| Ditto 4¼ p.c. Red. Deb. ... ... | 103—107 | +1 |
| Ditto 3⅜ p.c. Red. Deb. ... ... | 89—94 | +1 |
| Imperial Continental ... ... ... | 67—72 | +7 |
| Portsmouth Cons. ... ... ... | 90—95 | +3 |
| South-Eastern Gas Corporation Ord. (*x.d.*) ... .. ... | 14/—16/— | June 8 |
| South Metropolitan Ord. ... ... | 59—64 | +3 |
| Ditto 6 p.c. Pref. ... ... ... | 78—83 | +1 |
| Swansea 5½ p.c. Red. Pref. ... ... | 95—100 | +2 |
| Tottenham 4 p.c. Deb. (*x.d.*) ... | 85—90 | June 8 |
| Wandsworth 4 p.c. Pref. ... ... | 77—82 | +2 |
| Watford 3½ p.c. Red. Deb. (*x.d.*) .. | 84—89 | June 8 |

**SUPPLEMENTARY LIST**

| | | |
|---|---|---|
| Cheltenham Ord. ... ... ... | 95—100 | +12 |
| Ditto 4 p.c. Deb. ... ... ... | 90—95 | +8 |
| Croydon 4 p.c. Pref. ... ... ... | 78—83 | +10 |
| Hampton Court Ord. ... ... | 80—85 | +5 |
| Tunbridge Wells Sliding Scale ... | 120—125 | +25 |


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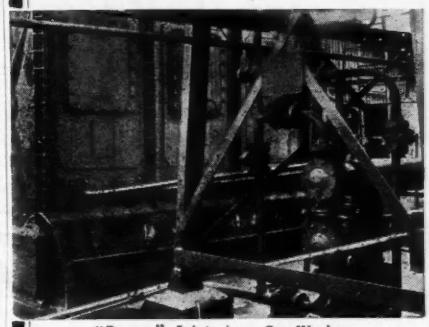

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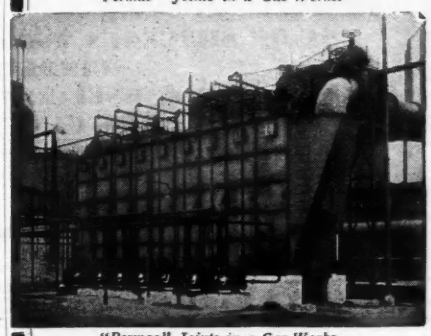
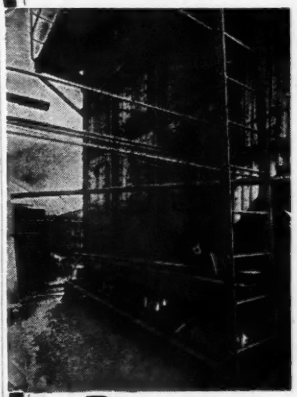


*"Permac" Joints in a Gas Works.*



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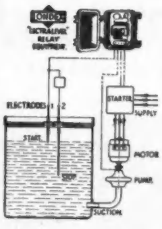

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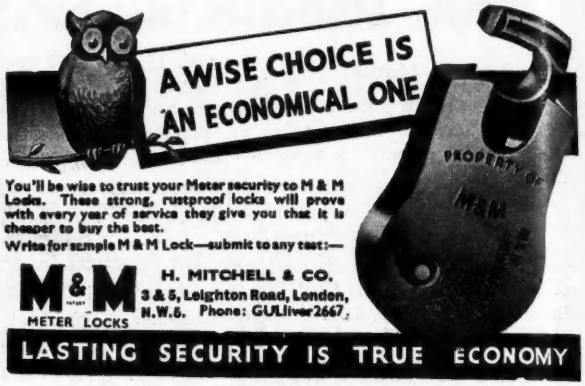


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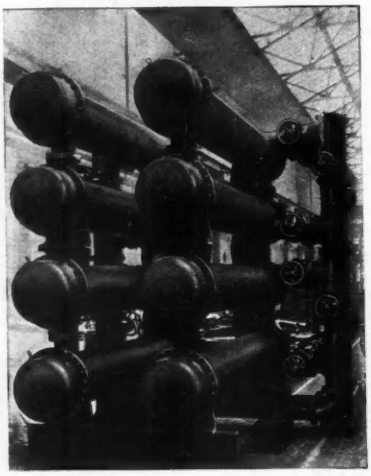

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# CONTENTS


**EDITORIAL NOTES**

Coal Economy .. .. .. .. 511
Gas Industry Research .. .. .. 512
Constitution of Public Services .. 512
Gas Bags for Motor Transport .. 513

Personal .. .. .. .. .. 513

Obituary .. .. .. .. .. 513
Letter to the Editor .. .. .. 513
The Gas Research Board .. .. 514
Retort Charging Machines .. .. 514
The Design and Operation of Gas-Fired Industrial Equipment in Relation to National Fuel Economy. By E. A. C. Chamberlain, B.Sc., Ph.D., A.R.C.S., D.I.C. .. .. .. 515

University Training and the Gas Industry. By D. T. A. Townend, D.Sc., Ph.D., D.I.C. .. .. .. .. 519
Discussion on Institution Papers .. 524

Gas Products Prices .. .. .. 533
Gas Stocks and Shares .. .. .. 533


## THIS WEEK'S ADVERTISERS


| | PAGE |
|---|---|
| Alder & Mackay, Ltd. | 530 |
| Aldridge & Ranken, Ltd. | 501 |
| Bale & Church, Ltd. | 538 |
| Balfour, Henry & Co., Ltd. | 534 |
| Blakeley, Firth, Sons & Co., Ltd. | 538 |
| Boulton Tubular Structures, Ltd. | 503 |
| Broom & Wade, Ltd. | Cover IV |
| Brotherhood, Peter, Ltd. | 509 |
| Clayton, Sons & Co., Ltd. | 540 |
| Clough (Croydon), Ltd. | Cover IV |
| Crane, Ltd. | 505 |
| Cowan, W. & B. | Cover III |
| Danks of Netherton, Ltd. | 537 |
| Davison & Partner, Ltd. | 500 |
| Dempster, R. & J., Ltd. | 493 |
| Dempster, Robert, & Sons, Ltd. | 522, 538 |
| Diaphragm & General Leather Co., Ltd. | 536 |
| Donkin Co., Ltd. (The Bryan) | Cover II |
| Ellison Insulations, Ltd. | 537 |
| Ether, Ltd. | 537 |
| Gas Meter Co., Ltd. | Cover IV |
| Gas Purification and Chemical Co., Ltd. | 537 |
| Gibbons, Bros., Ltd. | Cover I |
| Gibbons (Dudley), Ltd. | 498 |
| Glover, Thos., & Co., Ltd. | 510 |
| Goodall, Clayton & Co., Ltd. | 533 |
| Grant & West, Ltd. | 538 |
| Griffin & Tatlock, Ltd. | 506 |
| Holmes, W. C., & Co., Ltd. | 539 |
| Horstmann Gear Co., Ltd. | Cover II |
| Humphreys & Glasgow, Ltd. | 508 |
| Keith, Blackman, Ltd. | 540 |
| Kirkham, Hulett & Chandler, Ltd. | 502 |
| Lancashire Dynamo & Crypto, Ltd. | 497 |
| McMullans, Ltd. | 538 |
| Main, R. & A., Ltd. | 528 |
| Mewburn, Ellis & Co. | 537 |
| Ministry of Supply | 525 |
| New Bowson Coal Co. | 537 |
| Parkinson, W., & Co. | 510 |
| Pass, E., & Co. | 504 |
| Peebles & Co., Ltd. | 534 |
| Photostat, Ltd. | 535 |
| Potterton, T. (Heating Engineers), Ltd. | 530 |
| Press, William, & Son | 494 |
| Radiation, Ltd. | 526, 527 |
| Reavell & Co., Ltd. | 537 |
| Scientific & Projections, Ltd. | 499 |
| Spencer-Bonecourt, Ltd. | 504 |
| Strachan & Henshaw, Ltd. | 538 |
| Technological Institute of Great Britain | 538 |
| Terry, Herbert, & Sons, Ltd. | 503 |
| Trotter, Haines & Corbett, Ltd. | 537 |
| Tully, Sons & Co., Ltd. | 534 |
| Walker, C. & W., Ltd. | 507 |
| Walker, Crosweller & Co., Ltd. | 507 |
| Walker, James, & Co., Ltd. | 506 |
| Waller, Geo., & Son, Ltd. | 496 |
| Wellington Tube Works, Ltd. | Cover IV |
| West's Gas Improvement Co., Ltd. | 532 |
| Whessoe, Foundry & Engineering Co., Ltd. | 495 |
| Willey & Co., Ltd. | 535 |
| Woodall-Duckham Co., Ltd. | 521 |
| Wright, Alex., & Co., Ltd. | 501 |
| Trade Cards | 533 |
| Appointments Vacant | 538 |
| Company Notices | 538 |
| Educational | 538 |
| Patents | 537 |
| Plant, &c. | 538 |
| Plant, &c., For Sale and Wanted | 538 |



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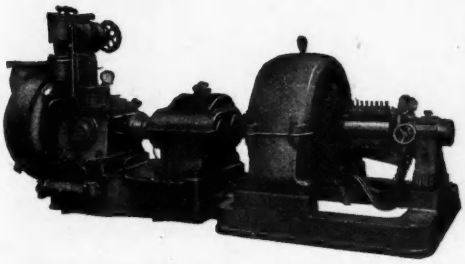

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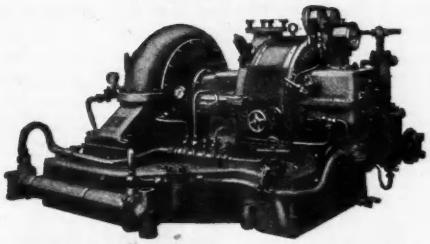

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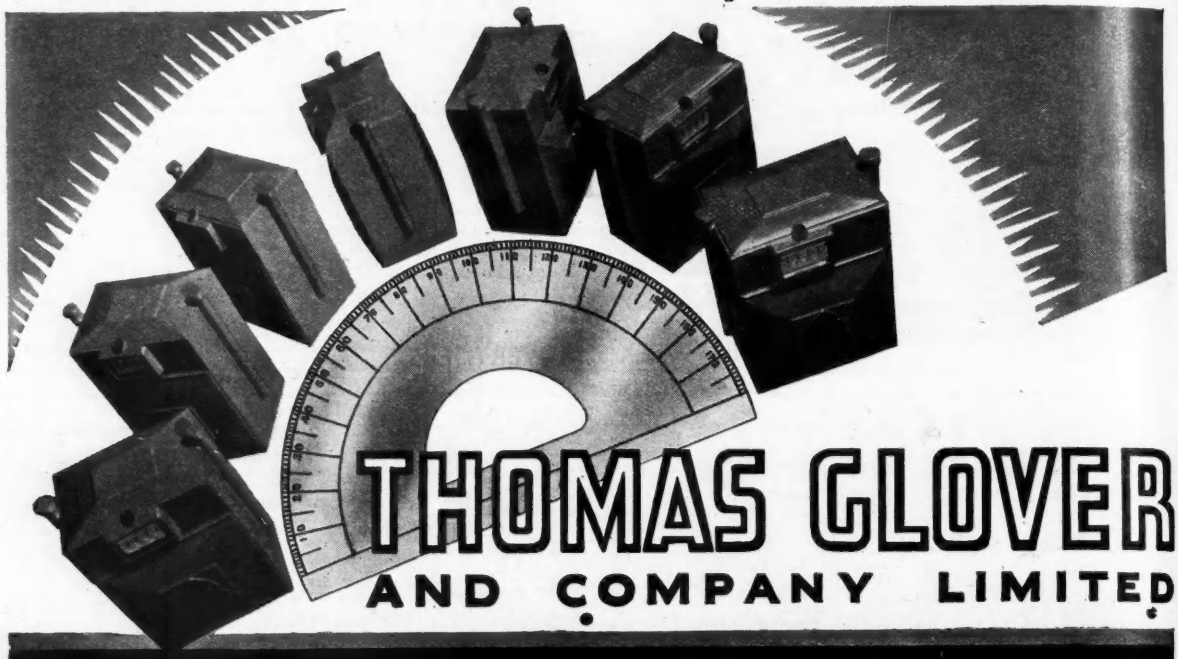

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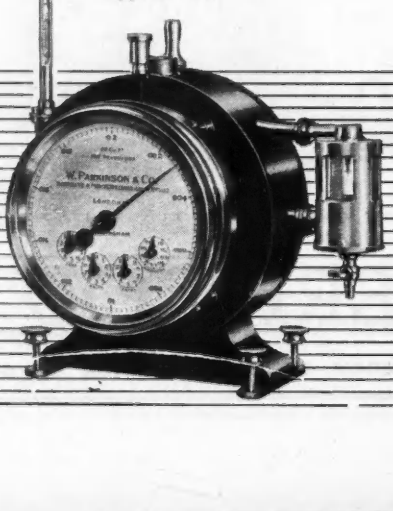


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